

Could the impact of a public policy help us to evaluate the changes implemented? An analysis of non-take-up of the Spanish minimum income schemes.

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This paper provides new evidence on why people who are eligible for a benefit do not claim it, commonly referred to as 'non-take-up'. It examines the relationship between the characteristics of the Guaranteed Minimum Income (GMI) and the non-take-up rate of these benefits. The study examines five main causal conditions in the design of a GMI: the amount of the benefit, the duration of the benefit, the administration's resolution times, the documentation requirements and an aggregation of supply-side factors. The sample used corresponds to the 19 existing regional GMI programmes in Spain. The existence of relationships between causal conditions is tested using the Fuzzy-set Qualitative Comparative Analysis (FsQCA) methodology. The results show that there are three different combinations of conditions that lead to less than 45% coverage of a GMI.

With these results, it is possible to evaluate ex ante whether the Spanish Vital Minimum Income (VMI) can avoid the non-take-up problem of other GMIs in Spain. We find that the features of the VMI are different from the combinations of causal conditions that lead to the failings of the GMI's coverage rate.

Keywords: : Non-take-up, Coverage, Fuzzy-set QCA, Minimum Income, Minimum Vital Income, Public Policy Evaluation

JEL Classifications: C11, D04, E6, H43, H50.

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1 Introduction

The VMI has been in place in Spain since May 2020. Its aim is to ensure that all citizens who lack the basic economic resources to meet their basic needs have a minimum income that allows them to survive and to avoid situations of poverty or social exclusion. It has been implemented to create a national income base that is equal across Regions and that can be complemented by regional GMIs, within the framework of a non-contributory benefit scheme, financed by taxes. It is configured as a subjective right of indefinite duration. The objective of the VMI is to be considered as a minimum income protection net, guaranteed by the Spanish Social Security, an applicable in the Spanish regions and cities (i.e. Ceuta and Melilla), allowing the transition from situations of social exclusion to a position of active participation in society (RDL 20/2020, of 29 May). The VMI is implemented to, among other objectives, reduce inequalities in regional benefits.

One of its objectives is the need to improve the coverage, which is an issue in the current system. Involving claimants in the necessary procedures and the homogenisation of the system will lead to an increase in the coverage of the benefit (RDL 20/2020, of 29 May). One of the main objectives is therefore to increase the take-up of the GMI system (Ministry of Social Rights and the 2030 Agenda, 2020).

As Ayala et al. (2016) point out, this is so relevant because the actual system has not achieved an adequate coverage level. Overall, the Spanish system of minimum income benefits has not worked properly.

Non-take-up is defined as the set of individuals or households who are entitled for benefits but do not claim them. Hernanz et al. (2004). This is particularly important because the non-take-up can affect both the efficiency (adjustment between costs and benefits) and the effectiveness (in terms of reduction or increase in the expected indicators) of the policy implemented. This is a general problem of the social policy in the European and OECD countries, with more than half of those eligible for means-tested social assistance in working age do not receive it (Fuchs et al., 2020).

Despite this problem, relevant literature has generally focused more on the benefits overpayment, as these represent additional costs for public administrations. Earlier shown by Korpi and Palme, (1998) and Matsaganis et al. (2010), public policies designed to target specific groups together with means-testing instruments have captured the interest of policymakers. However, the phenomenon known as non-take-up has generated a growing interest within public institutions (Eurofound, 2015; European Commission, 2013; Lain, B. and Julia, A. 2022). This interest is due to the impact that non-take-up has on the design of public policies, as low coverage distorts the objective for which they are designed. Moreover, as Hernanz et al. (2004) underline, knowing that an individual who is eligible for a benefit is not receiving it can help to highlight weaknesses in the policy and ultimately lead to improvements in its design.

There are several studies that quantify the percentage of people who are likely to receive a benefit but do not claim it. In social assistance programmes within the OECD, it ranges from 40-80% (Hernanz, 2004) and from 20-60% in the EU28 (Euromod, 2007). More localised studies show similar percentages. Among them, Bargain et al. (2012) show non-take-up rates of 40-50% for social assistance policies in Finland; Fuchs et al. (2020), estimate non-take-up of 39-51% for a programme similar to a GMI in Austria and Bruckmeier et al. (2013), a non-take-up of 67% in Germany. These studies show that non-take-up is a global problem, and since GMI benefits are similar across European countries, the findings for Spain could be applied to other countries.

Although there is limited research in this area in Spain, the work of Matsaganis et al. (2010) shows an estimated non-take-up of 60% for the minimum complement of contributory pensions and 20% in the non-contributory retirement pension. Khalifi et al. (2016) calculate a non-take-up of the Guaranteed Minimum Income (GMI) by homeless people of 67% and Laín, B. and Julià, A. (2022) estimate a non-take-up rate of 22.5% in the B-MINCOME pilot project in Barcelona.

The average of the studies analysed in this paper and in the study by Fuchs et al. (2020) estimates the level of non-take-up of social assistance benefits in Europe at around 55% of the total eligible population.

However, there are discrepancies as to which factors are the most accurate in explaining why potential beneficiaries do not claim a benefit, and on the relationships between these factors. The aim of this paper is not quantify non-take-up of GMI programmes in Spain, but rather to analyse its causes. This paper focuses on how policy design and administration can affect non-take-up and non-coverage, an issue that has been less explored in the literature. In addition, it is the first study that provides evidence on how the different drivers of non-take-up can be related to each other.

The aim of this work, using the FsQCA (Fuzzy-Set Qualitative Comparative Analysis) methodology, is to find out which policy design and administrative conditions are responsible for non-take-up and, above all, how these conditions are related to each other. The analysis is performed in two steps. The first consists of an analysing of the system before to the implementation of the VMI. The heterogeneity of the autonomous systems of GMI and the unequal development and impact of these programmes allow us to identify the conditions or set of conditions that lead to GMI coverage below 45%. This study analyses the amount of the benefit, the duration of the benefit, the administration's resolution times, the documentation requirements and an aggregation of supply-side factors.

In a second step, these results are used to check whether the VMI follows any of the sets of conditions that lead to in the low coverage of a GMI, and thus to the existence of a high non-take-up of the benefit.

We identify that there are three different combinations of conditions that lead to less than 45% coverage of a GMI.

Therefore, having identified which sets of conditions lead to high non-take-up rates and low-coverage rates, it is possible to evaluate *ex ante* whether the VMI, according to the same characteristics used in the analysis, will have the same problems as the GMI system. Or, on the contrary, it offers a solution to one of the main problems of the GMIs in Spain. The features of VMI do not follow any of the combinations of causal conditions that lead to coverage problems in a GMI.

We believe that this research is relevant because it provides new evidence on how policy design and administration features can affect non-take-up rates and offers the possibility of improving both GMI programmes and other public policies whose results are much lower than expected due to the fact that they are not sufficiently requested. Moreover, it has strong international implications because, as Matsaganis et al. (2003) point out, the non-contributory schemes in Europe share similar features, especially in the Southern European welfare model.

The data used come from the Guaranteed Minimum Income reports of the Ministry of Health, Social Services and Equality (various years), the regulations governing the GMI in each Spanish region, the study by Ayala et al. (2016) and the research by Hernández, A., Picos, F., & Riscado, S. (2020).

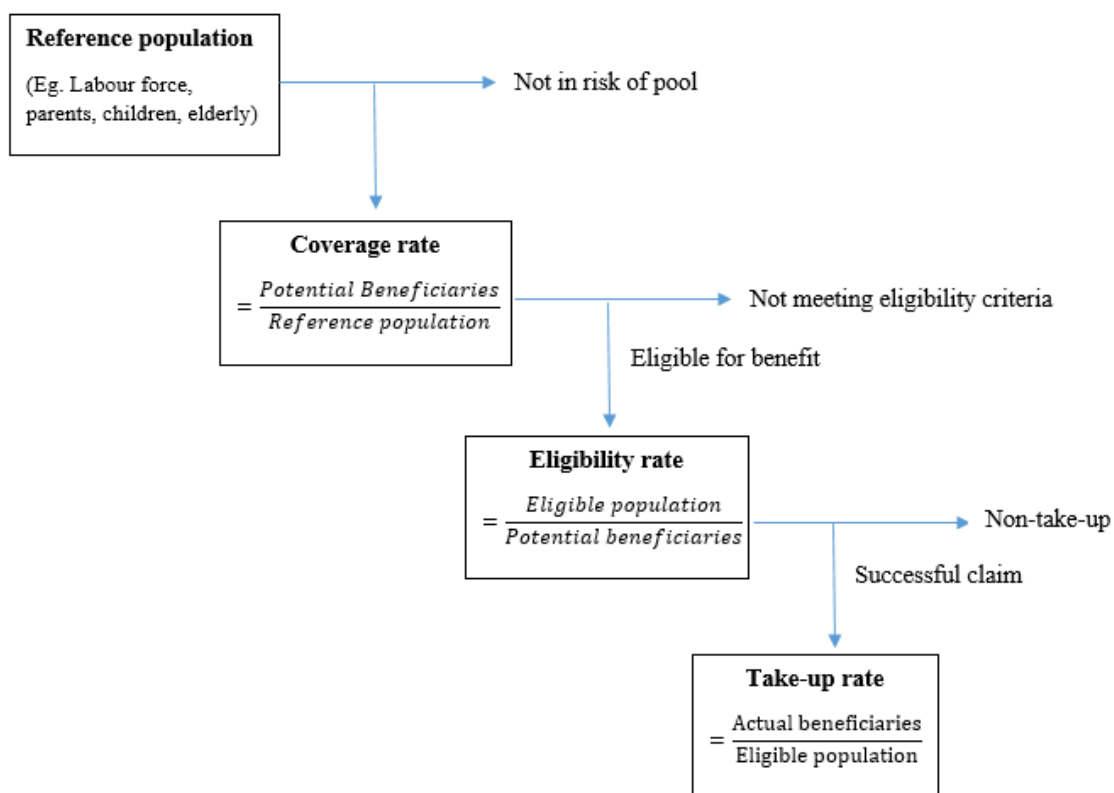
The paper is structured as follows. Section 2 presents an extensive review of the relevant literature on non-take-up. Section 3 contextualises the GMI in Spain and explains the new VMI. Section 4 explains the method used, Fuzzy-set QCA, and the steps followed to obtain consistent and logically valid results. Section 5 presents the variables that are theoretically fundamental to explain non-take-up and low-coverage, as well as the data used in the study. Section 6 then provides the results of the parsimony and intermediate solution and the reasoning behind them. Finally, section 7 highlights the main conclusions of the study and provides a series of recommendations that aimed at improving the performance of the GMI, evaluating the performance of the VMI *ex ante*, and to advancing in the analysis of a larger number of public policies.

2 Theoretical Framework: Non-Take-Up

Non-take-up is defined as the non-application for a benefit by a person or family unit entitled to it which can occur due to ignorance, indifference or rejection. Low coverage of a benefit is related to non-take-up, as a person who does not claim a benefit does not receive it. Nelson and Nieuwenhuis (2021) provide a conceptual framework to illustrate these relationships.

In this sense, this paper does not attempt to quantify non-take-up in GMI programmes. Following the definitions of Nelson and Nieuwenhuis (2021), these allow enable us to use the coverage achieved by each GMI as a proxy for non-take-up. The difference between coverage

Figure 1: A multidimensional framework for the analysis of benefit coverage.



Source: Nelson and Nieuwenhuis (2021).

and take-up of a policy is the identification of the eligible population, and as highlighted in Figure 1, the eligible population is a subsample of potential beneficiaries. Therefore, the causal relationships that we will analyse in this paper are kept to explain non-coverage and non-take-up.

There is a discussion of the literature that provides evidence of non-take-up. Non-take-up was first approached from the microeconomic theories of the consumer and individual rationality. According to these theories, and following Moffitt (1983), an individual seeking to maximise utility will only request a public policy if the benefits of receiving it exceed the costs of requesting it. However, Matsaganis et al. (2010) suggest that behavioural problems may arise because the costs are incurred at the time of the request and the benefits are distant and uncertain.

Several authors, such as Hernanz et al. (2004), Bruckmeier and Wiemers (2010), Bargain et al. (2012), Chareyron (2015) and Carrero (2018), Janssens, J., and Van Mechelen, N. (2022) have analysed which factors may determine the existence of non-take-up in different public policies.

In this sense, the costs and benefits of applying for such a policy are organised in different ways. Firstly, by distinguishing between monetary and non-monetary factors and, secondly, by organising the non-take-up factors at different levels: the client level, the administrative level, the policy design level and the wider social and legal context (Janssens, J., and Van Mechelen, N., 2022). In this study both approaches are mixed.

By using Qualitative Comparative Analysis, we aim to shed light on the policy design and administration characteristics that determine the success or failure of a GMI in terms of take-up, and the possible relationships between them. Possible differences in the characteristics of the claimants will not be addressed, although this parallel line of research could be approached using the same methodology.

2.1 Monetary factors

Benefits of receiving such a policy: The insufficient amount of a benefit increases non-take-up. Most of these studies, such as Hernanz et al. (2004), report a higher take-up rate as the benefit level increases. When quantifying this effect, the results vary depending on the measure used and the country analysed. For example, the work of Riphahn (2001) shows that a 10% increase in the amount of social assistance in Germany reduces non-take-up by 2%, and Bargain et al. (2012) report a 0.5% reduction for a similar policy change in Finland.

With regard to benefit duration, the empirical evidence is less clear and, according to the research by Khalifi et al. (2016), seems to depend more on the degree of future dependency of claimants based on their current economic situation. Furthermore, Chareyron et al. (2015) have considered that a higher probability of claiming a benefit is observed among the unemployed or in families where there are minors or pensioners.

2.2 Non-monetary factors

a) Client level: *Information costs, process costs and social and psychological costs.*

There may be a lack of knowledge of the benefit or, if it is known about, a lack of understanding as to whether it can be applied for. Lack of knowledge is a fundamental factor in the existence of non-take-up, and is greater in immigrant groups or those with a higher degree of social exclusion. Process cost derived from the need to gather evidence, the necessary documentation or distance to an office to make an application. An application process that requires large amounts of documentation to demonstrate the personal situation discourages potential applicants.

There may be a lack of knowledge about the benefit or, if known, a lack of understanding about whether it can be claimed. Lack of knowledge is a fundamental factor in non-take-up and is greater among immigrant groups or those with higher levels of social exclusion. Process costs, as the need to gather evidence, the documentation required or the distance to an office to make an application, or an application process that requires large amounts of documentation to prove personal circumstances discourages potential applicants.

Possible social stigma derived from receiving such a benefit.

Social stigma is itself a multidimensional phenomenon, which may be due to several factors. First, the more unconditional and universal the benefit, the lower the stigma associated with it. However, an individual who is less associated with particular social groups is more likely to apply for public benefits. For example, as Riphahn (2001) points out, take-up is higher in larger cities than in small towns because the anonymity of the applicant is not violated.

Social stigma can be personal, associated with the embarrassment of being identified as a benefit claimant, or collective, since claiming a benefit may result in the claimant being included in a particular group that is socially frowned upon.

b) Policy design level: *Existence of administrative errors and delays.*

Linked to an inadequate application process, which may lead to errors in the level of payment or in the resolution process. It may also be due to the lack of clear specification in public policy regulations. The time taken by the administration to resolve the issue may affect the rational balance of the applicant's behaviour, in the sense that the costs are incurred in the present but the benefits are in the future.

Degree and way of targeting of the policy. The higher the degree of targeting, the higher the associated non-take-up (van Oorschot, 2002). Rules and regulations put in place by policymakers to assess the means of claimants increase the time and effort required to understand the benefit and gather the necessary evidence. It is also highlighted when these procedures require too much personal information and are perceived as stigmatising.

Other reasons, such as the time when the claim can be presented. If it is only possible during working hours, a person in employment may not be able to apply for the benefit. Or, for psychological reasons related to self-perception and pride, a person may not want to be seen applying for the benefit.

c) Level of administration. *Degree and quality of information provided by administrators.*

Specific information on eligibility rules, conditions for application procedures as well as targeted information (e.g. mailing campaigns) play an important role in reducing non-take-up.

User-friendliness of the application procedure.

Related to the cost of the application process (both time spent on administrative requirements and other seemingly minor costs). Providing personal assistance has been shown to be an effective measure (Finn and Goodschip, 2014). Clever design of deadlines and reminders is a mechanism that has been found to be useful in reducing non-take-up.

Internal and external organization of agencies charged with policy delivery:

Collaboration between agencies offering similar social programmes is also an important factor in reducing non-take-up. Moreover, the higher the level of integration of social services, the higher the quality of information and administrative services and the lower the information costs (Raeymaeckers and Dierckx, 2012). The availability of different information channels could increase the take-up of a policy.

d) Broader Social and Legal Context. This could *either* facilitate or inhibit agents' behaviour in relation to non-take-up.

It could be influenced in different directions: at the client level, Reijnders et al. (2018) show that social conventions about when it is acceptable to ask for help are a barrier for people seeking social support from third sector organisations. Next, the policy design level is influenced by the broader social context in the sense that perceptions of need or deservingness are motivated by the 'culture' of the society. Finally, focusing on the administrative level, it is highly influenced by the social context in the sense that the role of social services and administrative workers depends on the training of street-level bureaucrats and the density and functions of third-sector organisations.

e) Possible interactions between the above points.

This study provides new evidence on the relationships between characteristics of the different levels of non-take-up and drivers. It focuses on the policy design and the administration level (the documentation requirements, the administrative resolution times, the publicity of the benefit, a supply-side factor that could be called "political will"), but also uses as a variable the monetary drivers (amount and duration of the benefit). The FsQCA methodology makes it possible to analyse the relationships between these factors.

3 Guaranteed Minimum Income in Spain

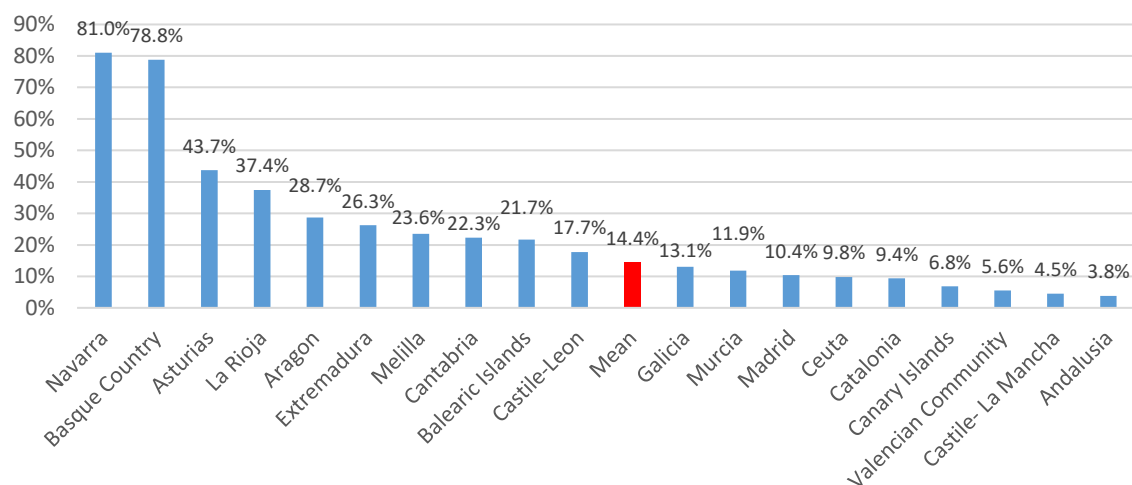
GMI began to be institutionalised in Spain at the end of the 1980s. As Arriba (1999) points out, they came about after religious and social groups and trade unions called for a national programme. Nevertheless, the central government allowed the autonomous regions to develop their own programmes, arguing that the aim should be to strengthen employment (Aguilar et al., 1995).

The GMIs are designed with a twofold objective: to provide a safety net for those who have lost their entitlement to the main public benefit (i.e. unemployment benefit), and to help beneficiaries reintegrate into society and the labour market.

The development of GMIs in Spain began in 1989 in the Basque Country. Subsequently, it spread and each Spanish region implemented its own GMI programme. As a result, as shown early by Fuenmayor and Granell (2011) and more recently by Muñoz-Higueras and Granell (2020), the system is extremely heterogeneous, underdeveloped, very unequal between regions and far from the European level. This is why, from a quantitative point of view, Bergantiños et al. (2017) show that the GMIs have failed to provide sufficient coverage to avoid poverty, as the amount of benefits is insufficient.

In 2019, only 369,000 households were holders of a GMI in Spain, and the total number of beneficiaries did not exceed 795,000, with an average amount per holder of €489 (*Informe de Rentas Mínimas de Inserción, 2020*). The total coverage of the system was 14.4%, ranging from 81% in Navarre to 3.8% in Andalusia, reflecting differences between the different GMI programmes.

Figure 2: Minimum income coverage rates in Spain by regional criteria (2018).



Source: Hernández, A., Picos, F., & Riscado, S. (2020).

3.1 The Minimum Vital Income (VMI)

The VMI was approved on 29 May 2020. It is articulated as a non-contributory social security benefit, as a subjective right and of indefinite duration, compatible with the receipt of other benefits and with work, as long as it does not exceed an income threshold determined according to the size and characteristics of the family unit. It can therefore act as a wage supplement.

The amount varies between €462 and €1,015 per month, depending on the applicant's income and family situation. For single-parent families, there is a monthly supplement of €100.

The VMI is very restrictive in terms of wealth, since an applicant cannot have wealth, other than their usual residence (unless it is of exceptional value) that exceed three times the maximum annual amount corresponding to the circumstances. For example, this limit is €16,614 for an individual adult.

It is important to remember that this is a supplement to the income of the family unit. The amounts shown in Table 1 are the maximum income levels that must be reached by adding any personal income to the amount of the VMI. Therefore, the monthly income of the family unit must be deducted from the maximum amount of the benefit.

The VMI is linked to the signing of an integration agreement and the applicant's active job search. Therefore, in order not to discourage applicants from actively looking for a job, an employment incentive is set in advance. This is based on the fact that part of the income from a new job is not taken into account when calculating personal income, which means that the amount of the benefit is reduced by less than the increase in income.

In relation to non-take-up, the law refers several times to the lack of coverage and protection intensity of the GMI system in Spain. *'...these are very different models, with very substantial variations in their design, and especially in their degrees of coverage and level of protection', '...the regional minimum income systems present great disparities in the conditions of access, coverage and sufficiency (...). As a result, many of those in need do not receive support (...). The amounts are low and coverage is lacking.'* (RDL, 20/2020, of May 29). Therefore, the VMI seems to have strong intentions to achieve high coverage rates by homogenising the rules and conditions of access.

Table 1: Amount of VMI by household characteristics

VMI amount (€/month)		Adults		
		1	2	3
Children	0	462	600	738
	1	700	738	877
	2	838	877	1015
	3	977	1015	1015
	4 or above	1015	1015	1015

Source: Adapted from *Royal Decree-law 20/2020*

The VMI is expected to reach around 800,000 families (2.3 million people) living in poverty and social exclusion, of which up to 1.6 million could be lifted out of poverty. The annual cost is estimated at 3,000 million euros (RDL, 20/2020, of May 29).

4 Methodology: Fuzzy-Set QCA

The QCA methodology, following Ragin (1987), is based on categorising cases according to whether causal conditions are present or absent. It identifies the necessary and sufficient conditions and the causal relationships between them that lead to a given outcome. Ragin (2008) explained that a condition is necessary if the outcome cannot occur without it, and it is sufficient if the outcome occurs whenever the condition is verified, even if it can be obtained through other conditions.

The QCA methodology differs from regression methods in that it does not consider marginal effects. This type of analysis, as advocated by Woodside (2013), is appropriate when the number of cases is small (< 30), although it can also be used with larger samples. We use this method for two main reasons: 1) our sample consists of only 19 observations due to the lack of unified microdata sets, which makes it impossible to perform regression analysis, and 2) the QCA methodology has an attribute, equifinality, explained by Ragin (2008), which consists of the possibility that more than one sufficient (but not necessary) condition can exist to produce a result. The equifinality provided by this method can help to understand a phenomenon as complex as non-take-up.

Fuzzy-set QCA is a variant of the QCA method that allows scaling of the explanatory conditions within the interval from 0 to 1. The different cut-off points are defined by calibrating the conditions and the result.

The sample used corresponds to the 19 GMI programmes existing in Spain (17 corresponding to the different Autonomous Regions, plus the two applicable to the Autonomous Cities of Ceuta and Melilla). These programmes are heterogeneous in terms of their characteristics and their performance is generally inefficient, although there are some successful examples.

This normative heterogeneity is necessary for the use of QCA, since the characteristics to be analysed must be present in the cases that are classified as successful, as well as in those that fail. In this way we can obtain information about the interactions between them.

The FsQCA process follows a specific sequence, or steps, as described by Ragin (2008) and Roig-Tierno et al. (2015):

- 1) Calibration of the outcome and conditions: the transformation of variables into sets. In this study, the FsQCA is used as the method of analysis, where, as Ragin (2008) points out, calibration allows the best of quantitative and qualitative research to be brought together.

- 2) Construction of the Truth Table. The Truth Table shows the set of all possible logical configurations. It is constructed in such a way that each row corresponds to a different combination of causal conditions that may or may not lead to the result. It consists of 2^k rows (where k is the number of causal conditions used), in this study, it is composed of 32 (2^5) rows.
- 3) Setting a consistency cut-off for a combination of conditions is considered to contribute to the outcome. Consistency indicates the rate at which a condition or combination of conditions is sufficient for the outcome.
- 4) In this study, the cut-off is set at 0.8, as recommended by Ragin (2008) for analyses with fuzzy variables. Subsequently, the Quine-McCluskey algorithm developed by Fiss (2007) reduces the rows of the truth table.
- 5) The process offers three solutions: complex, parsimonious, and intermediate solution. The configuration of these solutions is different but equally valid in terms of logic since, none of them contains contradictory information.

5 Data and variables used

In line with the literature, which identifies the main determinants to be analysed, both the outcome and the explanatory variables used in this study are presented below. In this research, we focus on the policy design and administrative characteristics of a GMI scheme, which are the least studied factors in explaining non-take-up. We use the following variables, which are explained in the (section 5.1.2):

- 1) Amount (in euros) that a single-member household would receive.
- 2) Duration (in months) of the benefit.
- 3) Resolution time (in months) that the administration can take to resolve an application.
- 4) The set of documents that an applicant has to submit.
- 5) Supply-side factors: combining a) Publicity channels: shows that each GMI programme can be promoted through different information systems, b) Administrative silence: the application of a citizen could be accepted or rejected after the legal deadline has passed. and c) Subjective right: which ensures that a positive resolution of the benefit will be effective independently of budgetary constraints. It can be translated as 'political will' to develop such a policy, in the sense that all these factors depend directly on the will of politicians to create a more accessible benefit.

The values of the variables used for each of the observations in the sample are shown in Table 2.

Table 2: Data from each Spanish region GMI (2015) and VMI (2020)

Sample	Dependent variable	Causal conditions						
	Coverage (%)	Amount (€)	Duration (months)	Resolution time (months)	Documentation (no. of documents)	Publicity (channels)	Administrative silence	Subjective Right
Andalusia	3.80	402	6	4	8	3	Negative	No
Aragon	28.70	441	12	2	10	2	Positive	No
Asturias	43.70	442	Undefined	3	10	1	Negative	No
Balearic Islands	21.70	429	12	6	8	1	Negative	No
Canary Islands	6.80	472	12	4	11	1	Positive	No
Cantabria	12.60	426	24	6	9	2	Negative	No
Castile-Leon	17.70	426	Undefined	4	9	3	Negative	Yes
Castile-La Mancha	4.50	372	6	3	0	1	Negative	No
Catalonia	9.40	426	12	4	11	2	Negative	No
Valencian Community	5.60	330	6	4	4	1	Negative	No
Extremadura	26.30	426	12	6	13	2	Positive	Yes
Galicia	13.10	399	12	3	12	2	Positive	Yes
Madrid	10.40	375	Undefined	4	9	3	Negative	No
Murcia	11.90	300	12	5	12	1	Negative	No
Navarre	81.00	625	12	3.66	9	1	Positive	Yes
Basque Country	78.80	619	24	2	7	2	Positive	Yes
La Rioja	37.40	399	24	3	6	2	Positive	No
Ceuta	9.80	300	12	3	10	1	Negative	No
Melilla	23.60	458	12	3	10	2	Negative	No
Mean GMIs	14.40	431.52	13	3.8	9	2		
VMI	-	462	Undefined	3	4	3	Negative	Yes

Source: Adapted from *Informe de Rentas Mínimas de Inserción* from the Ministry of Health, Consumption and Social Welfare. (2015), Ayala et al. (2016), and GMI regulations for each of the observations.

As already mentioned by Fuenmayor and Granell, (2011) and Muñoz-Higueras and Granell (2020), the GMI system in Spain is very heterogeneous and generally underdeveloped, evidence by the low coverage rates, with only two regions exceeding 45%.

Looking at each programme individually, we find regions that, according to the literature, have favourable characteristics. However, these characteristics alone are not sufficient to provide an attractive and simple benefit that is suitable for those for whom it is designed.

The GMI in Canary Island, offers a higher amount than the mean of the system, lower than to the Basque Country and Navarre programmes (which are the ones with the greatest coverage in their benefits), but differs in other characteristics (higher documentation requirements, shorter duration of the benefit...). The Castile-La Mancha programme does not require any documentation at the time of application, which is a positive feature missing in the other programmes, and only if the resolution is approved does the applicant required to submit the relevant documents. However, in this programme the amount is much lower, the maximum duration is very limited and there is no channel through which the benefit is advertised.

These are some of the examples that show the difference between the GMI programmes in Spain. Clearly, there are theoretically positive features but, in the absence of other features, these programmes do not result in high coverage rates.

Due to this heterogeneity, we believe that the methodology used can provide interesting results. The main limitation of the variables used is the impossibility of measuring the perceived stigma associated with receiving a GMI.

As we are concerned with the phenomenon of non-take-up, we analyse the conditions that lead to the absence of coverage (as a proxy of non-take-up). The QCA methodology requires heterogeneity in the conditions and outcomes, in other words, multiple combinations of conditions to arrive at the output. Therefore, given that there are only two successful cases in terms of coverage, it would not be correct to carry out the research in this way since the results would be excessively determined by the conditions of both cases. However, this fact does not invalidate the analysis, as Ragin (2013) shows that the QCA methodology presents a causal asymmetry, according to which the absence or presence of an outcome requires different analyses and explanations.

We can also appreciate that the VMI has characteristics that, according to the literature, would allow us to achieve a sufficient coverage rate. Its positive features are the indefinite duration of the benefit, the low number of documentation requirements and the high level of publicity of the benefit. However, the reference amount of the benefit is not much higher than the average of the GMIs, which, as mentioned above, is insufficient, and the administrative resolution period is within the required time limit.

5.1 Calibration

The first step in the FsQCA methodology is the calibration of outcomes and conditions. As Verkuilen, (2005) shows, calibration is carried out according to the qualitative calibration method, based on the researcher's knowledge to identify the location of the theoretical anchors. These must make theoretical sense, either because they fit a conceptual classification, as Medina et al. (2017) point out, or because there are obvious separations between the data. Conditions have a natural anchor because they are a discrete variable.

5.1.1 Outcome variable

The variable we use to approximate non-take-up is the coverage rate of these programmes. This variable is used as an outcome.

The GMI coverage rate comes from the research of Hernández, A., Picos, F., & Riscado, S., (2020) (Table 1). Our own calculations are based on SILC data (Poverty Indicator) and the *Rentas Mínimas de Inserción* report (2018) of the Ministry of Health, Social Services and Equality.

The focus of this study is not on what causal relationships must exist for a benefit to have a 100% take-up rate: we are more interested in the current situation of GMIs in Spain and what characteristics, or relationships between them, a GMI should have in order to reach a coverage rate of 45%, sufficient to be considered a success. Given the level of non-take-up of benefits in Spain, Europe and the OECD (the average of the studies analysed in this paper and the study by Fuchs et al. (2020) estimates the level of non-take-up of social assistance benefits in Europe at around 55% of the total eligible population), and given that the current system is well below this 45% coverage threshold, it would be considered a success if the coverage of the GMI system in Spain reached at least this value.

In this sense, it should be noted that 'success' refers to this methodology and the comparison with other minimum income schemes in Europe, but from a policy implementation point of view, the take-up should be much higher.

Therefore, coverage has been calibrated (see Table 3) according to the following axioms: taking into account Figure 1 and the non-take-up estimated by other authors. We consider a programme to be successful if its coverage exceeds 45%. Given this threshold, the variable is divided by 10 in order to capture as much as possible the differences between GMI programmes. Thus, each 5% increase in GMI coverage would increase the calibration by 0.1. Other calculations have been carried out with different calibrations and the results do not show any significant variation. We consider this to be the best calibration.

Table 3: Calibration of the outcome

Coverage (%)	> 0%	> 5%	> 10%	> 15%	> 20%	> 25%	> 30%	> 35%	> 40%	> 45%
	≤ 5%	≤ 10%	≤ 15%	≤ 20%	≤ 25%	≤ 30%	≤ 35%	≤ 40%	≤ 45%	
Calibration	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1

Source: compiled by the authors

5.1.2 Causal conditions – explanatory variables

The causal conditions used in this study were selected for their relevance and availability. Following the discussion of the theoretical framework in section 2. In order to clarify the sign expected from the literature, we have hypothesised the values that each variable would take, either positive or negative, in order to achieve the expected result.

In order to prevent each variable individually from influencing the causal results of the outcome, the ratio recommended by Ragin (2008) is applied, according to which the sample should be at least four times the number of causal conditions used.

In addition, the regulations in force in 2015 were analysed to check the impact of these characteristics on GMI's performance in each region. We believe it is necessary to give a benefit a period of time in order to be able to evaluate its performance. For this reason, the data sources used are the regulations of each GMI programme in that year, the *Informe de Rentas Mínimas de Inserción* of the Ministry of Health, Social Services and Equality (2015) and the study by Ayala et al. (2016).

The causal conditions used are presented below and the results of their calibration are shown in Table 9.

Amount

We take into account the reference amount (in euro) that a single-member household would receive, according to the current regulations, if it had no previous income.

As Ayala et al. (2016) point out, the aim of the GMI is to lift beneficiaries out of poverty and facilitate their social reintegration and entry into the labour market. In this variable, it is only possible to quantify the first aspect. It has therefore been calibrated according to whether it succeeds in lifting the applicant out of poverty (1)¹, severe poverty (0.66) or fails to lift beneficiaries out of severe poverty (0.33)

¹ The at-risk-of-poverty threshold per consumption unit is calculated for those whose income is below 60% of the regional median income; for severe poverty, the threshold drops to 40% of the median income. The median annual income per consumer unit is calculated for each region.

Table 4: Calibration of ‘Amount’

Amount (€)	> 0 ≤ 40% of median	≥ % 40 of median < 60% of median	≥ 60% of median
Calibration	0.33	0.66	1

Source: compiled by the authors

Hypothesis 1: Low GMI amount leads to higher non-take-up rates.

Duration

In relation to the duration of the benefit, the empirical evidence is less clear and seems to depend more on the degree of future dependency of the claimant. Therefore, in our analysis, both the presence and the absence of duration can lead to a lack of coverage. The initial duration of the benefit (in months) is taken into account once a positive decision has been taken on the application. We take into account the time until new documentation is required, even though the benefit may be renewed. The calibration is as follows:

Table 5: Calibration of ‘Duration’

Duration (months)	> 0 ≤ 6	> 6 < 24	≥ 24
Calibration	0.33	0.66	1

Source: compiled by the authors

Hypothesis 2: Expected duration of the benefit can contribute to the presence or absence of non-take-up.

Resolution time

This is the maximum time (in months) that the competent administration can take to resolve an application. The above framework shows that the longer the resolution time, the more discouraging it is to apply for a benefit. It takes into account the sum of the time for referral to the region and the time for resolution. In cases where there is evidence that the periods are longer because of administrative delays, the higher value is calculated in relation to the limits set by law.

The calibration is carried out considering the maximum time (6 months) and minimum time (1 month) set by the regulations and the delay for those administrations where there is evidence of this problem. Each additional month taken by the administration to resolve the request increases the calibration value by 0.2.

Table 6: Calibration of 'Resolution time'

Resolution time (months)	$\geq 1 < 2$	$\geq 2 < 3$	$\geq 3 < 4$	$\geq 4 < 5$	$\geq 5 < 6$	≥ 6
Calibration	0	0.2	0.4	0.6	0.8	1

Source: compiled by the authors.

Hypothesis 3: Longer resolution periods discourage applicants from claiming a benefit and thus increase non-take-up.

Documentation

Oorschot (2002) argues that non-take-up is strongly linked to means testing. According to the documentation requirements laid down in each law, the set of documents that an applicant has to submit is calculated, as shown in Table 8.

The documentation to be submitted depends on the characteristics of the household. In this study it is assumed in all cases that there is a family unit in which minors live and that some members of the same unit receive some form of income, either from work or from benefits.

Calibration is performed by taking as a reference the number of documents to be submitted by the household.

Table 7: Calibration of 'Documentation'

Documentation (n°)	No need	$>0 \leq 4$	$>4 \leq 8$	$>8 \leq 10$	$>10 \leq 12$	>12
Calibration	0	0.2	0.4	0.6	0.8	1

Source: compiled by the authors

Hypothesis 4: The higher the documentation requirements, the higher the non-take-up of a GMI.

Supply side factors

This variable is constructed as a combination of the main administrative factors, as we can see in Table 2, there are: a) Publicity channels: shows that each GMI programme can be promoted through different information systems, from the Autonomous Communities (social services, own GMI system, among others) or through the link with other services (employment or education). A lack of publicity means that applicants are unaware of the existence of a benefit and of the requirements for applying for it. The number of publicity channels can range from 1 to 3. b) Administrative silence: a citizen's application could be accepted or rejected after the legal deadline has expired. It can be (1) if the administrative silence is positive or (0) if the administrative silence is negative; and c) Subjective right: which ensures that a positive resolution of the benefit will be effective regardless of budgetary constraints. It can be (1) if the benefit is implemented as a subjective right or (0) in any other case.

Table 8: Calibration of ‘Supply side factors’

Average	$\geq 0 \leq 0.33$	$> 0.33 \leq 0.66$	$> 0.66 \leq 1$
Calibration	0.33	0.66	1

Source: compiled by the authors

Hypothesis 5: Lack of supply-side factors of a GMI increases its non-take-up.

Table 9: Calibration of the variables

Sample	Dependent variable	Causal conditions				
	Coverage	Amount	Duration	Resolution time	Documentation	Supply side factors
Andalusia	0.1	0.66	0.33	0.6	0.4	0.33
Aragon	0.6	0.66	0.66	0.2	0.6	0.66
Asturias	0.9	0.33	1	0.4	0.6	0.33
Balearic Islands	0.5	0.33	0.66	1	0.4	0.33
Canary Islands	0.2	0.66	1	0.6	0.8	0.66
Cantabria	0.5	0.33	1	1	0.6	0.33
Castile-Leon	0.4	0.33	1	0.6	0.6	1
Castile-La Mancha	0.1	0.66	0.66	0.4	0	0.33
Catalonia	0.2	0.33	0.66	0.6	0.8	0.33
Valencian Community	0.2	0.33	0.33	0.6	0.2	0.33
Extremadura	0.6	0.66	0.66	1	1	1
Galicia	0.3	0.33	0.66	0.4	0.8	1
Madrid	0.3	0.33	1	0.6	0.6	0.33
Murcia	0.3	0.33	0.66	0.8	0.8	0.33
Navarre	1	0.66	1	0.4	0.6	1
Basque Country	1	0.66	1	0.2	0.4	1
La Rioja	0.8	0.33	1	0.4	0.4	0.66
Ceuta	0.2	0.33	0.66	0.4	0.6	0.33
Melilla	0.5	0.66	0.66	0.4	0.6	0.33
Mean	0.3	0.33	0.66	0.4	0.6	0.66
VMI	-	0.66	1	0.4	0.4	0.66

Source: compiled by the authors

We will refer to this variable as the 'political will' to develop such a policy, in the sense that all these factors depend directly on the will of politicians to create a more accessible benefit.

To approximate this variable, we average these three variables and calibrate the result.

Table 9 above shows the values of the variables used for each of the observations in the sample and the VMI. Following the steps of this methodology, the outcome and the calibrated conditions are presented according to the rules explained above.

6. Results

Using the fuzzy-set QCA model, we can proceed to an analysis of the necessary and sufficient conditions for non-coverage (~) of a GMI. It should be emphasised that we are using non-coverage as a proxy for the non-take-up of a GMI. This corresponds to the following model:

$$\sim\text{Coverage} = f(\text{Amount, Duration, Resolution time, Documentation, Supply side factors})$$

6.1 Necessary Conditions

Before presenting the Truth Table, the analysis of necessary conditions is presented. A condition is necessary if the result cannot occur without it. Schneider et al. (2010) point out that for a condition to be classified as necessary, its consistency must be greater than 0.9. The analysis is performed for both the presence and absence of the outcome. However, in our analysis we are only interested in the absence (O) of the outcome. FsQCA 3.0 software was used for this purpose.

Consistency indicates the proportion of cases that have both a causal condition and the outcome of interest over the total number of cases that have the outcome of interest. Coverage measures the proportion of cases with a condition.

Table 10: Analysis of the necessary conditions

Causal Conditions	■ Outcome		O Outcome	
	Consistency	Coverage	Consistency	Coverage
■ Amount	0.755172	0.737374	0.635922	0.735129
O Amount	0.728736	0.628345	0.772816	0.788900
■ Duration	1	0.595890	0.840777	0.593151
O Duration	0.317241	0.627273	0.427184	1
■ Resolution time	0.678161	0.556604	0.757281	0.735849
O Resolution time	0.678161	0.702381	0.543689	0.666667
■ Supply side factors	0.859770	0.707317	0.617476	0.599434
O Supply side factors	0.511494	0.530393	0.696117	0.854589
■ Documentation	0.781609	0.629630	0.766990	0.731481
O Documentation	0.666667	0.707317	0.611650	0.768293

Source: compiled by the authors

Regarding the factors explaining the absence of coverage, although we did not find any necessary conditions, there were indications of some effects. As Schneider et al. (2010) argue, if a condition stands out from the rest and its consistency value is close to 0.9, it can be considered quasi-necessary.

It is interesting to note the sign that duration takes, since with a consistency above 0.8 it seems to indicate that the longer the duration of the benefit, the less likely it is to be claimed.

This finding is consistent with the literature, as it does not clarify how this might affect the duration of the benefit and non-take-up, since even if a benefit is long-lasting, if it is not attractive in relation to other factors, it will not be claimed by potential beneficiaries. The analysis needs further investigation to find out how these variables behave.

Steps 2 and 3 are performed together. The Truth Table (Table 11) is presented after applying the specified consistency threshold (0.8). The Truth Table shows all possible combinations of conditions and indicates the number of existing cases for each condition configuration.

Table 11: Truth Table.

Amount	Duration	Resolution Time	Documentation	Supply side factors	Number of cases	Coverage	Raw consist	PRI consist
0	1	0	0	1	1	1	1	1
1	0	1	0	0	1	1	1	1
1	1	0	0	0	1	1	0.908163	0.739131
0	1	1	1	0	4	1	0.900185	0.751152
0	1	1	0	0	1	1	0.884615	0.625
1	1	0	1	0	1	1	0.874317	0.589286
0	1	0	1	0	2	1	0.843521	0.625731
0	1	1	1	1	1	1	0.838063	0.505102
1	1	1	1	1	2	1	0.803858	0.445454
0	1	0	1	1	1	0	0.784047	0.463768
0	1	0	0	1	1	0	0.744639	0.364078
1	1	0	0	1	1	0	0.736944	0.35545
1	1	0	1	1	2	0	0.709497	0.324675

Source: compiled by the authors

The outcome of interest covered by each condition configuration divided by the total number of cases in that configuration shows values above 0.8, which would be expected to validate the analysis. The PRI (Proportional Reduction in Inconsistency) value indicates the extent to which a configuration is part of the outcome, rather than the absence of the outcome. High values of the PRI parameter are also sought, so that a condition does not simultaneously contribute to the presence and absence of an outcome. According to Medina et al. (2017), high values of both indices indicate that there is no simultaneity in the subset relationship.

The idea behind the Truth Table is simple: according to the data matrix, the cases can be sorted according to the possible combinations in the variables. The data matrix is constructed to order the cases according to the possible combinations of the independent variables. Each case represents one such combination. Every possible logical combination of each of the values of the independent variables represents a row of the Truth Table. Thus, each of these rows (logical combinations) is coded as 1 or 0 in the dependent variable, based on the number of cases (of the original matrix) that share that combination of values in their independent variables. In this way, both the combinations of values in the independent variables and the associated values in the dependent variable are coded as 1 or 0. The corresponding values in the dependent variable are summarized in the Truth Table.

Our Truth Table does not present contradictory conditions. Therefore, the expressions shown here, with a consistency greater than 0.8, are likely to be considered sufficient for the occurrence of the result.

6.2 Sufficient Conditions

The Truth Table offers three different results depending on the degree of logical complexity. First, it offers the Complex solution and the Parsimonious solution, both of which are valid. However, as Ragin (2008) points out, there are criticisms of their excessive or overly simplified logical processes. Logical minimization² must then be performed to obtain the intermediate solution. Despite its name, the intermediate solution is considered to be the final solution. Its name comes from the fact that its degree of complexity lies between the complex solution and the parsimonious solution.

Schneider (2013) shows that the 'complex solution' is not presented in this studies since it often tends to be too complicated in its theoretical interpretation and may not pass the fundamental tests of methodological correctness of configurational comparative methods.

² Logical minimization is considered when two Boolean expressions, that differ only in a causal condition and still produce the same result, are reduced. In this case, the causal condition that distinguishes both expressions can be suppressed to obtain a simpler final expression (Ragin, 1987).

This first solution shows us a 'minimum solution' that cannot be simplified. These seem to indicate that an application resolution time of more than 4 months or the absence of supply side factors of a GMI, which, as was mentioned above, it can be translated as a lack of political will to develop the benefit (we remember that this variable is constructed as an average of the publicity, administrative silence and the subjective right of a GMI), are therefore relevant in order to explain the absence of coverage.

Table 12: Parsimonious solution

Configuration						Coverage		Consist.
	Amount	Duration	Resolution Time	Supply side factors	Document	Raw	Unique	
1			■			0.757281	0.164078	0.735849
2				O		0.696117	0.102913	0.854589

solution coverage: 0.860194

solution consistency: 0.732231

Squares '■' indicate the presence of the condition. Circles 'O' the absence.

Source: compiled by the authors

Table 13: Intermediate solution

Configuration						Coverage		Consist.
	Amount	Duration	Resolution Time	Supply side factors	Document	Raw	Unique	
1		■		O		0.626213	0.864078	0.843137
2			■	O		0.593204	0.0533981	0.886792
3		■	■		■	0.639806	0.161165	0.818633

Solution coverage: 0.840777

Solution consistency: 0.802595

Squares '■' indicate the presence of the condition. Circles 'O' the absence.

Source: compiled by the authors

As mentioned above, the mechanisms behind non-take-up are due to monetary, non-monetary and a combination of monetary and non-monetary factors. We found three combinations of conditions leading to low coverage, all of which are plausible in line with the literature.

Table 13 shows the results of the intermediate solution. For each, the set of sufficient causal conditions and the coverage and consistency of each solution are given. Ragin (2008) points out that the model is robust with respect to its fitting parameters.

The result shows three combinations of sufficient conditions that lead to a low coverage of a GMI and, after the planned analysis, to a high non-take-up of the GMI:

- 1) Lack of political will to develop the benefit, even if the duration of the benefit is more than 24 months.
- 2) Lack of political will to develop the benefit combined with an application resolution period of more than 4 months.
- 3) An application resolution period of more than 4 months combined with the requirement of at least 8 documents to make the application benefit, even if the duration of the benefit is more than 24 months.

With these results, which are consistent with the literature, we demonstrate a new way of analysing the non-take-up phenomenon and the interactions between its possible causes. The results show that monetary and non-monetary factors are interrelated and that there may be more than one combination that causes non-take-up.

6.3 Does the Spanish VMI solve non-take-up problem?

After analyzing the GMI system in Spain and verifying that there are three sets of causal conditions that lead to a coverage of less than 45%, we can verify *ex ante* whether the VMI will be able to solve this problem.

The VMI has a series of administrative features that could *a priori* help in this respect: it has an indefinite duration, has low documentation requirements and has been highly publicised. However, its amount would only barely lift the beneficiaries out of severe poverty and the administrative silence is negative.

Overall, the structure of the VMI does not follow any of the sets of causal conditions that lead to low coverage, so our analysis rules out the possibility that the outcome of the VMI in terms of coverage would be inferior to that of the current GMI system.

The latest reports from the VMI show that as of (03/01/2022) more than 428,000 households have received the benefit, which affects more than 1,060,000 people (La Moncloa, 09/29/2022). More specifically, in Andalusia, for example, the number of beneficiaries of the minimum income has tripled since the introduction of the VMI. It can be said that the VMI is in the

process of solving the problem of non-coverage and non-take-up of minimum income benefits in Spain.

Moreover, the latest AIREF report (07/19/2022) shows that the non-take-up rate in the VMI is around 57%, which is much lower than in the regional system. Further evaluation of its impact and results in the future would be necessary to see if it has managed to solve the existing non-take-up problem.

7. Conclusions

The study allows us to evaluate ex-ante changes in a service by analysing the previous system. In this case, the study attempts to further analyse the determinants of non-take-up and non-coverage and the relationship between them, using the FsQCA methodology with the 19 existing GMI programmes in Spain. To this end, it analyses the policy design and administrative characteristics of the GMI (amount, duration, resolution time, documentation required and supply-side factors) and the coverage rate achieved by them (used as a proxy for non-take-up).

As shown above, the GMI system is too heterogeneous in terms of amounts, application rules and outcomes, which results in a low overall coverage of the GMI system in Spain. Tackling this non-take-up of benefits is essential if the GMI is to be an effective tool for fighting poverty and facilitating the social and professional reinsertion of beneficiaries.

The implementation of VMI attempts to solve several of the existing problems, mainly the low coverage of the system and the high non-take-up. For this reason, a more generous benefit in terms of amount, with shorter resolution times and fewer documentation requirements and declared as a subjective right, has been put together

Using the FsQCA methodology, we analyse the GMI system before the introduction of VMI. First, we find that there are no necessary conditions that individually lead to low coverage, a fact that confirms the multi-causal condition of non-take-up. Continuing the analysis, the intermediate solution provides us with three sets of causal conditions that lead to the low coverage of a GMI and indicate issues that the competent administration could work on to improve the uptake of GMI.

First, a GMI has low coverage if there is no political will to provide a benefit, even if the duration of the benefit is more than 24 months. This hypothesis is in line with the literature and allows us to verify a first interaction between monetary and non-monetary factors.

The second hypothesis shows that coverage is affected when there is a lack of political will to develop the benefit, combined with a claim resolution period of more than 4 months. In this case, long waiting periods for an uncertain future benefit discourage claimants.

Finally, an application resolution period of more than 4 months coupled with the requirement of at least 8 documents to claim the benefit, even if the duration of the benefit is more than 24 months. This hypothesis corresponds to the traditional notion of non-take-up,

which argues that if the cost in terms of time and effort to gather the necessary documents is higher than the possible subsequent benefit, a potential claimant will ultimately not claim the benefit.

It is also interesting to note how long resolution times and high documentation requirements create a vicious circle. Simplifying the procedure could help to solve both issues at the same time. This may also have some impact on possible administrative errors in the assessment of applications. Muñoz-Higueras and Granell (2020) show that the difficulty of the GMI application procedure leads to different probabilities of obtaining a positive decision depending on where it is processed. It is therefore necessary to design a new, simpler benefit that reduces the bureaucratic burden on the administration and applicants.

However, we have not been able to relate the amount of the benefit to other variables. This does not mean that the variable is not important, since the aforementioned literature and other analyses corroborate this.

Despite these relevant results, the inability to measure the possible stigma attached to the benefit makes it impossible to know how this is related to the other conditions. However, as the non-contributory system has similar characteristics in Europe, these results could be applied to all Europeans' those public policies with high rates of non-take-up.

Regarding the transformation of the GMI system, the entry into force of the VMI aims to solve the main problems already discussed by creating a basic income at the national level, with similar rules and protocols, in order to homogenise the income guarantee system. Fuchs et al. (2020) estimate that a 23 percentage point reduction in non-take-up in a programme analogous to a VMI in Austria can be attributed to the introduction of a higher living standard, the simplification and acceleration of administrative and application procedures, and the integration of the policy into labour market programmes. These changes are similar to those introduced with the VMI.

Finally, the experience provided by the current system is relevant to evaluate the changes implemented and, in response to the question that motivated this research and in view of the results obtained, we can affirm that the VMI does not present any of the sets of causal conditions that lead to low policy coverage. However, the evaluation should be repeated in the future to verify these results and to correct possible errors in the implementation of the VMI.

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