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CASH INFRASTRUCTURE AND CASH ACCESS VULNERABILITY IN SPAIN

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ABSTRACT

The article highlights how the distribution of the cash infrastructure affects cash users in Spain. The more cash infrastructures are scaled down and/or concentrated, the wider the gap becomes between those who have difficulty accessing cash and those who have easy access to it. To assess the coverage of the cash infrastructure and, therefore, the level of access to cash throughout Spain, the article examines its geographical distribution and concentration. It also analyses whether the distribution adequately satisfies the demand for cash, according to the socio-demographic characteristics of the different regions of Spain. To this end, a cash access vulnerability index is presented, which identifies the municipalities that have a higher risk of financial exclusion in terms of access to cash. The index shows that cash access vulnerability is low throughout most of Spain, although there are approximately 1,300,000 people who may be considered vulnerable in this respect.

Keywords: access to cash, financial inclusion, cash infrastructure, spatial analysis.

JEL classification: C38, E41, G21.

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Introduction

The use of cash is still important for many people, especially those who lack easy access to certain conventional financial services or who have poor digital skills. In this respect, it is essential to ensure that those people who wish to use cash have access to it. Indeed, the level of physical access to basic financial services and means of payment such as cash partly determines the level of financial inclusion of the population.

In Spain, the number of cash access points has fallen very significantly since 2008. The number of bank branches has decreased by almost 50% and the number of automated teller machines (ATMs) by 20%.[1] This reduction in installed capacity has been unequal across provinces, with an asymmetrical impact on the coverage of the traditional cash infrastructure and, therefore, on access to cash.

The article analyses how the unequal distribution of the cash infrastructure affects access to cash for different population segments. The more cash access points are scaled down and/or concentrated among a relatively small number of municipalities, the wider the gap tends to become between those who have difficulty accessing cash and those who enjoy easier access to it. To assess the coverage of the cash infrastructure and, therefore, the level of cash access throughout Spain, the article examines its geographical distribution and degree of concentration. It also analyses the extent to which its distribution satisfies the demand for cash, according to the socio-demographic characteristics of the different Spanish provinces.

The article first refers to the data used for the analysis. This is followed by a review of the traditional cash access infrastructure and its geographical distribution. The article then goes on to analyse the level of access that the Spanish population has to cash distribution points and the level of sensitivity to a hypothetical decrease in their number. It also provides an overview of other cash access points currently in operation in Spain that represent an alternative to the traditional channels. Lastly, an index is presented that measures the level of vulnerability of the Spanish population in terms of access to cash.

1 See Jiménez Gonzalo and Tejero Sala (2018).

Data

For the purposes of this analysis, both traditional and alternative cash access points existing in Spain at end-2020 have been considered, segmented by municipality,[2] and also the socio-demographic characteristics of the population.

Traditional cash access points are understood to be bank branches that offer counter services[3] and ATMs of any kind, including on-site (located in branches) and off-site bank ATMs and those run by independent operators.[4] Alternative cash access points are understood to be any other locations that provide the public with the facilities to withdraw or deposit cash, be it their main line of business (for instance, financial agents or mobile branches) or a complementary one (for example, post offices).

The coverage of the cash infrastructure is defined as the percentage of the population with at least one cash access point within a certain radius. For the purposes of this study, two distances – 5 km and 10 km – are analysed. The distance to the access point is measured in a straight line ("as the crow flies") from the centre of the municipality.

Lastly, the socio-demographic characteristics that are most important in the use of cash are analysed at the municipal level, drawing on population data, population over 60 and average disposable income per municipality.

Traditional cash access infrastructure

At end-2020, there were 22,299 bank branches in Spain and 49,481 ATMs of all kinds. This gives a ratio of 1.5 cash access points per 1,000 inhabitants. Charts 1.1 and 1.2 show how the different types of traditional cash access points are distributed across Spain.

Banking infrastructure comprises mainly bank branches and on-site ATMs; off-site ATMs account for just 8.5% of the total. These access points cover urban and rural areas, with 78% of bank branches and ATMs located in municipalities with a population of more than 10,000.

The ATMs run by independent operators are essentially concentrated in large urban areas along the Mediterranean coast and in southern and central Spain. They are to

2 The database used in this analysis includes a total of 68,692 bank branches and ATMs, which account for 96% of all access points. In contrast to previous studies, such as Jiménez Gonzalo and Tejero Sala (2018), this analysis takes into account the precise location of ATMs.

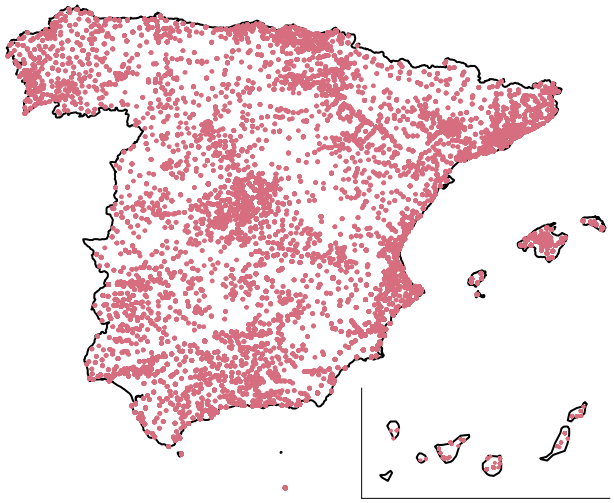
3 For the purposes of this analysis, all bank branches are understood to provide counter services and, therefore, are included as access points. Counter services are not guaranteed in all bank branches and may be subject to restrictions in terms of hours of the day or days of week on which they are available.

4 Three independent ATM providers currently operate in Spain: Euronet, Euro Automatic Cash and Cardtronics.

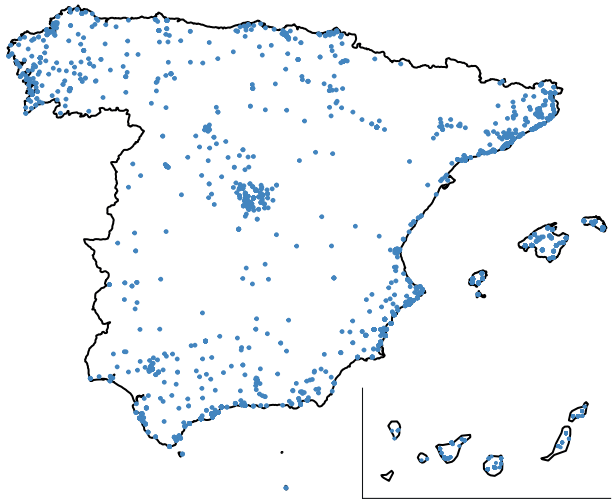
Chart 1

DISTRIBUTION OF BANK BRANCH AND ATM NETWORK

1 BANK BRANCHES AND ATMs



2 INDEPENDENT ATMs



SOURCES: Banco de España, INE, Euronet, Cardtronics and Euro Automatic Cash.

be found mainly in high-traffic sites, such as railway stations, airports or shopping centres, and are less common in rural areas. In Spain there are almost 6,000 independent ATMs (12.1% of the total), of which approximately 1% are located in municipalities with a population of less than 10,000.[5]

As Chart 2 shows, Cuenca is the Spanish province with the highest number of traditional cash access points per 1,000 inhabitants (2.4), although they are concentrated[6] among a relatively small number of municipalities within the province. At the opposite end of the scale, Cádiz has 1.1 access points per 1,000 inhabitants, with a relatively more uniform geographical distribution.

In general, there are no major cross-provincial differences in the number of traditional cash access points per population; however, there are differences in the level of concentration. In the northern half of the Spanish mainland – with the exception of the Cantabrian coast and the Galicia region – cash access points are more unevenly distributed between the municipalities of each province, compared with the southern half of Spain where the distribution is more equal. The highest degree of concentration is observed mainly in the provinces of the Castile-Leon region.

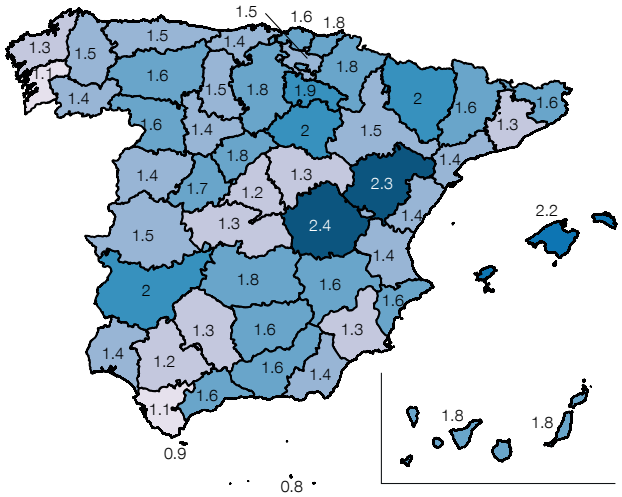
5 The number of independent ATMs in rural areas has increased in recent years on account of the public subsidies offered by the municipal authorities.

6 The degree of concentration is measured using a Gini index, where 1 denotes the highest concentration and 0 the greatest equality in terms of distribution. A degree of concentration close to 1 means that relatively few municipalities in the province have cash access points, whereas a degree of concentration close to 0 means that a relatively high number of municipalities in the province have cash access points.

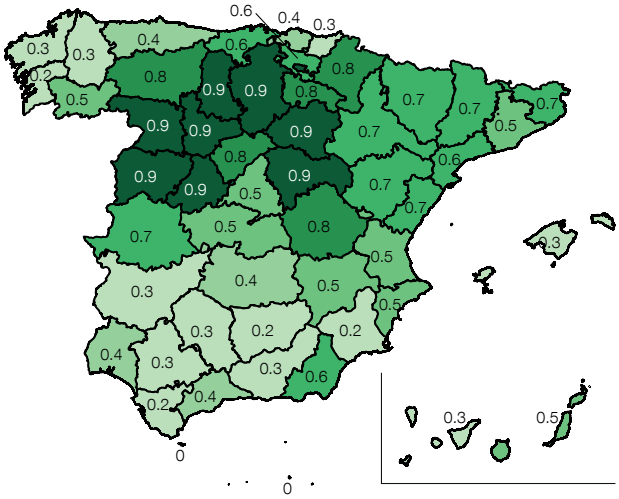
Chart 2

CASH ACCESS POINTS BY PROVINCE

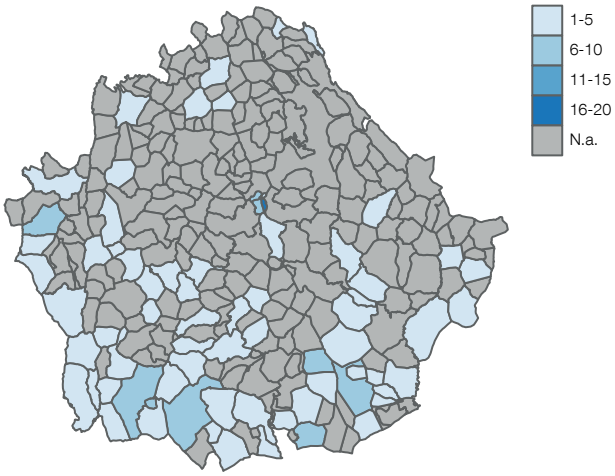
1 CASH ACCESS POINTS PER 1,000 INHABITANTS



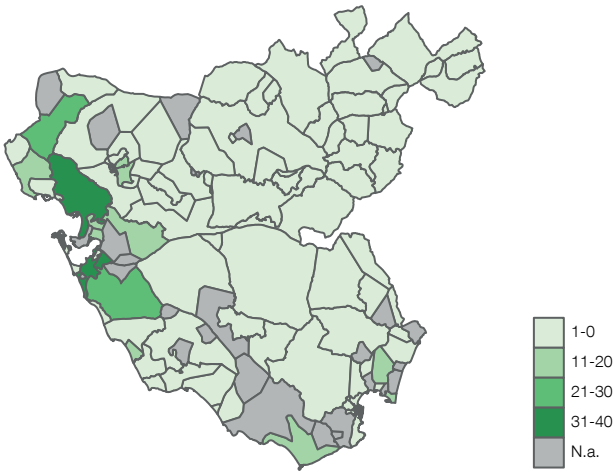
2 DEGREE OF CONCENTRATION



3 BANK BRANCHES AND ATMs BY POSTCODE, IN CUENCA



4 BANK BRANCHES AND ATMs BY POSTCODE, IN CADIZ

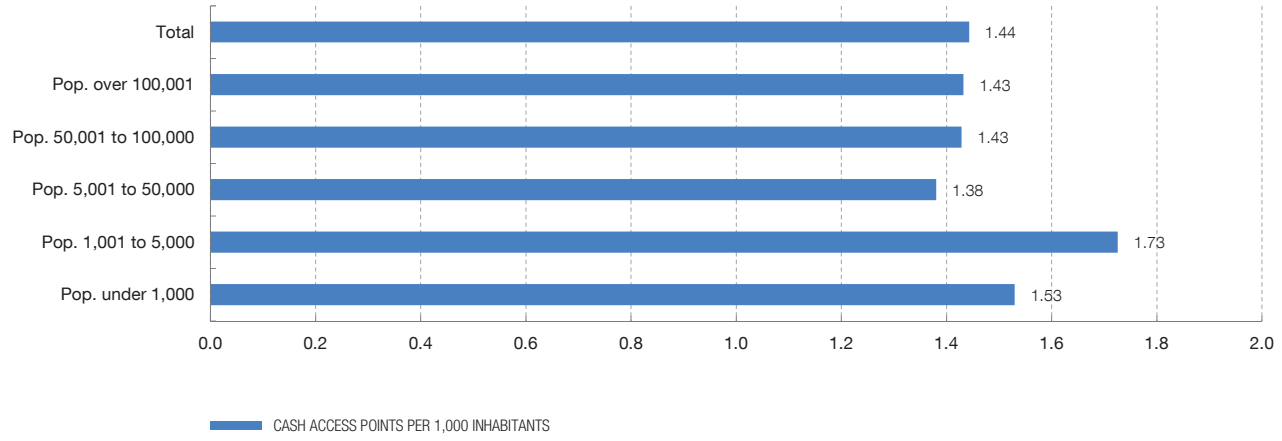


SOURCES: Banco de España, INE, Euronet, Cardtronics and Euro Automatic Cash.

By size of municipality, the number of traditional cash access points per 1,000 inhabitants is above the national average in municipalities with a population between 1,000 and 5,000[7] (see Chart 3). Conversely, in municipalities with a population of more than 5,000 it is below the national average.

7 Spain currently has almost 1,800 municipalities with a population between 1,000 and 5,000; of these, 90% have at least one cash access point.

Chart 3
CASH ACCESS POINTS BY SIZE OF MUNICIPALITY



SOURCES: INE, Euronet, Cardtronics, Euro Automatic Cash and Banco de España.

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Traditional cash access in Spain

There is a high level of correlation between the geographical distribution of the traditional cash access infrastructure and the demographic distribution of the Spanish population. Unsurprisingly, many cash access points are located in densely populated areas, while in the rural areas there is a greater level of dispersion of bank branches and ATMs.

Overall, in aggregate terms, in Spain a high proportion of the population has a cash access point quite close to home. Yet at end-2020 almost 1,200,000 people did not have a traditional access point in their municipality (see Table A1.1).

To calibrate traditional cash access in Spain, two benchmarks have been established: a maximum distance of 5 km and of 10 km from the nearest access point, whether or not located in the same municipality. The findings show that more than 98% of the population has a traditional cash access point within a 5 km radius, although not necessarily within their home municipality. Yet as Chart 4 shows, there is a high level of cross-provincial heterogeneity.

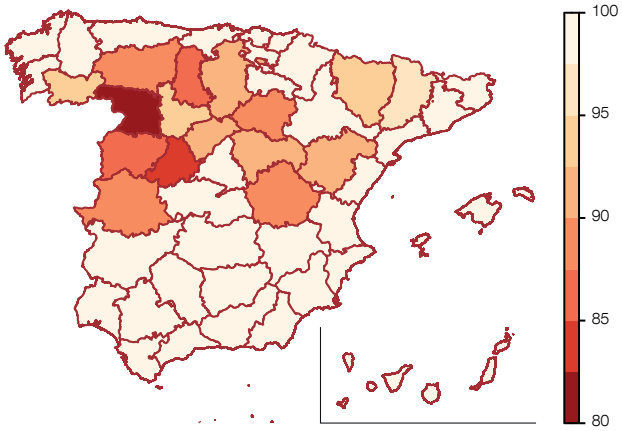
Thus, in six Spanish provinces (including, for example, Vizcaya, Tenerife and Cádiz) and in the city enclaves of Ceuta and Melilla, 100% of the population has a bank branch or ATM within a 5 km radius. In 36 provinces this percentage is between 90% and 99%, and in the other eight provinces it is below 90%.

Castile-Leon is the region with the lowest coverage, and Zamora and Ávila the provinces with the lowest percentage of population that has a traditional cash access point within a 5 km radius (81% and 85%, respectively; see Chart 4.1). This significant

Chart 4

PERCENTAGE OF POPULATION WITH A CASH ACCESS POINT

1 PERCENTAGE OF POPULATION WITH A CASH ACCESS POINT IN A 5 KM RADIUS



2 PERCENTAGE OF POPULATION WITH A CASH ACCESS POINT IN A 10 KM RADIUS

SOURCES: Banco de España, INE, Euronet, Cardtronics and Euro Automatic Cash.

difference compared with other Spanish provinces is explained by their lower population density, and by other factors, such as their orography. This has meant that they have traditionally had a lower level of branch and ATM coverage, which has had to be offset, in part, by alternative solutions such as financial agents or mobile branches. In areas where the situation was already less favourable, the banking sector consolidation of recent years has made it worse.[8]

If we take a 10 km radius as a benchmark, the coverage provided by traditional cash access points increases to almost 100% of the population across the country (see Chart 4.2). Specifically, in provinces that had lower coverage within a 5 km radius (for instance, Zamora), the percentage of the population with a bank branch or ATM increases to more than 95% when the distance is extended.

Sensitivity by province to closure of traditional cash access points

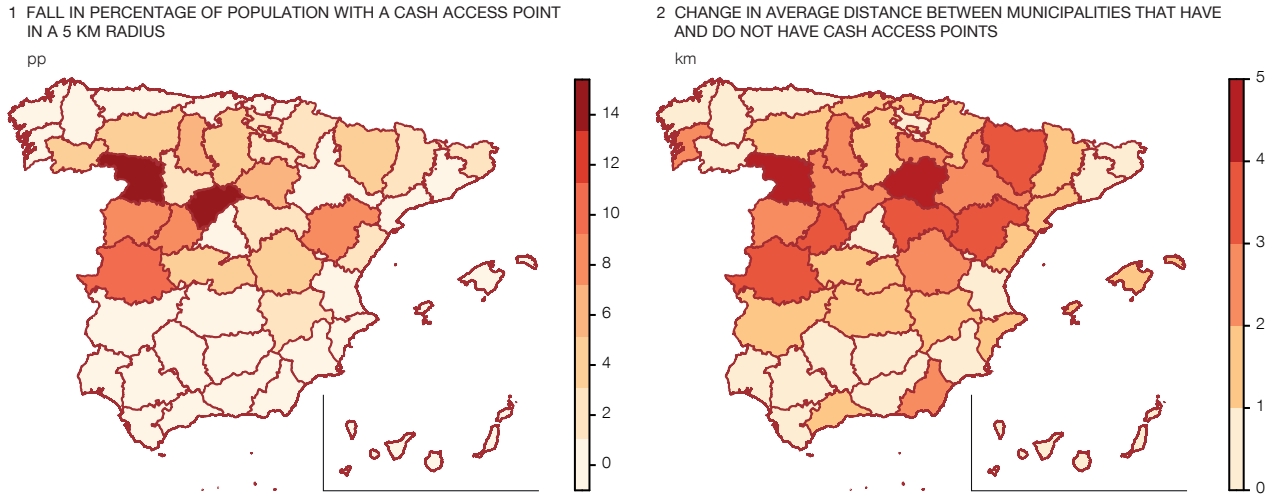
Next we analyse the consequences, in terms of coverage, of a possible closure of bank branches and ATMs in different regions. The impact may be very unequal across provinces depending on their current situation.

Chart 5.1 shows, for the different provinces, how the percentage of the population with a cash access point within a 5 km radius would fall in the event of closure of the bank branches or ATMs in municipalities with a population of less than 5,000 that

8 In 2008, more than 70% of the municipalities of Castile-Leon had no bank branch; this affected 13% of the region's population.

Chart 5

SENSITIVITY TO CLOSURE OF CASH ACCESS POINTS IN MUNICIPALITIES WITH A POPULATION UNDER 5,000



SOURCES: Banco de España, INE, Euronet, Cardtronics and Euro Automatic Cash.

have only one cash access point and that in turn provide services to neighbouring municipalities that have no access point. Chart 5.2 shows how the average distance between municipalities that have and do not have access points would change in the event of such closure.

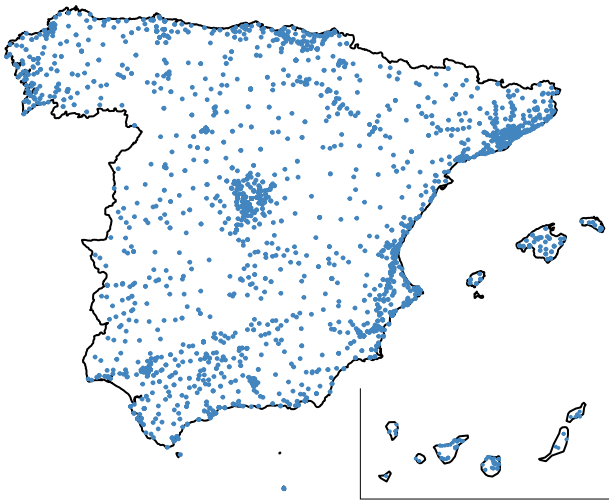
A comparison between two provinces with similar coverage – for example, Cáceres and Soria – reveals the possible effects of such a hypothetical closure. In Cáceres many municipalities serve as the nearest cash access point for their neighbours, with one access point serving up to seven municipalities in some cases. Were these access points to disappear, the impact on coverage would be substantial. Specifically, the percentage of population with a cash access point within a 5 km radius in this province would fall from 89% at present to 79%. Moreover, the average distance between municipalities that have and do not have cash access points would rise from 7.8 km to 11.2 km (see Chart 5.2).

In Soria, which currently has similar coverage to Cáceres, closing these access points would have a lesser impact: coverage would fall by five percentage points (5 pp) to 83% and the average distance between access points would increase slightly more, by some 4 km to 13.5 km.

Alternative ways to access cash

The decrease in the number of bank branches and bank ATMs is being partially offset by an increase in the number of alternative channels that provide access to cash.

Chart 6
POST OFFICES AS CASH ACCESS POINTS



SOURCES: Banco de España and Correos.

Mobile branches or financial agents that travel to different municipalities to provide access to banking services have been in operation in some rural areas for many years. In addition to these solutions, some financial institutions are promoting the use of post offices as an alternative way to access cash.

In countries such as Ireland, the United Kingdom or Australia, post offices are widely used for this purpose in rural areas, whereas in Spain they are still rarely used to withdraw and deposit cash. However, considering the dispersion and geographical reach of the Spanish network, were this use to become more widespread post offices could become cash access points complementing bank branches and ATMs.

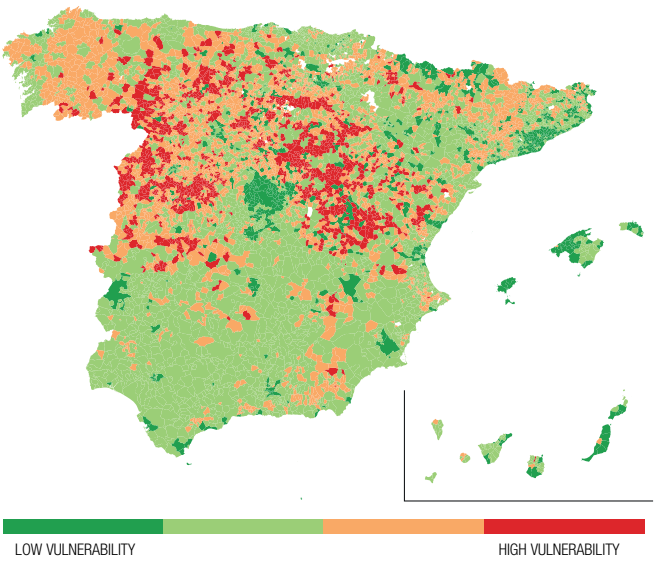
Chart 6 depicts the distribution of Spain's post offices, which are mainly located in urban areas with a population of more than 10,000. Taking into account post offices as well as bank branches and ATMs, 99% of the population has a potential cash access point within a 5 km radius.

None of the other alternative access points (such as mobile branches or financial agents), which by definition have no specific location, can be included in a calculation of cash access coverage in broad terms.

Also, not all credit institutions currently operate with financial agents or mobile branches. These services are most common in the Castile-Leon and Madrid regions.

Cash-back and cash-in-shop, i.e. withdrawal or deposit of cash in a retail outlet, are other alternative cash access channels. They have only recently been introduced in

Chart 7
CASH ACCESS VULNERABILITY INDEX



SOURCE: Banco de España.

Spain and are gaining a foothold mainly in large urban areas. Lastly, Spain's government-licensed *estancos* (small stores selling, inter alia, tobacco products and stamps) and lottery outlets also serve as cash access points driven by new forms of digital banking.

All the above-mentioned alternative channels complement part of the coverage provided by the traditional ones. Yet they cannot be considered close substitutes for various reasons: among others, because the availability of cash is not guaranteed, and because the possibility of withdrawing or depositing cash depends in some cases on the willingness of the retail outlet.

Cash access vulnerability index

One fundamental principle for ensuring financial inclusion is that the availability of cash access points is at least aligned with the demand for cash. In this respect, cash access vulnerability is considered to be higher when supply, measured in terms of cash access points, is lacking in places where there is a greater need for cash. Conversely, vulnerability will be low where available access points and demand for cash are aligned.

Data on the use of cash are limited and incomplete, but the socio-demographic characteristics that determine a higher use of cash than other means of payment are well-known. Age, income and education level are all key demand factors: the older

population, low earners and people with a lower level of education use cash as a means of payment more frequently than the rest of the population.

To identify the regions that are most vulnerable in terms of cash access, we construct an index that takes into account four supply and demand factors: on the supply side, the number of traditional cash access points per 1,000 inhabitants for each municipality and the distance from those access points; and on the demand side, the average disposable income per person and the percentage of population over 60 in each municipality.

In short, cash access vulnerability is determined by the interplay between different variables and for this reason we adopt a multivariate statistical approach. Specifically, we use a principal component analysis to construct the cash access vulnerability index.

This statistical method allows us to represent a set of correlated variables through principal orthogonal (i.e. uncorrelated) components, thus maximising the information obtained from the original indicators. It is common practice to use the first components to construct the aggregate indicator, as they capture the bulk of the variance. In this respect the index is constructed using the first principal component.

The results show that distance from the closest cash access point is the key determinant of the degree of vulnerability, followed by the percentage of persons over 60 (see Table A2.1). Interestingly, of the four above-mentioned factors there is no single dominant factor and the weights are not evenly distributed.

Regarding the degree of vulnerability, the municipalities may be grouped into four quartiles, based on the range between the lowest and the highest value of the index. This gives rise to four categories: very low vulnerability (index below 98.9); low vulnerability (index between 98.9 and 99.7); medium vulnerability (index between 99.7 and 101); and high vulnerability (index over 101).

According to the degree of vulnerability by quartiles, most of the Spanish population lives in areas with low or very low vulnerability. However, approximately 3% of the population has medium or high vulnerability in terms of access to cash (see Table A2.2).

Some 340,000 people (0.7% of the Spanish population) live in municipalities that have high vulnerability, i.e. where there are no traditional cash access points, the average distance to the closest access point is 9.4 km, more than 40% of the population is over 60, and disposable income is below the national average. In general, these are small municipalities with an average population of 400. The provinces of León, Salamanca and Zamora concentrate most of the population living in municipalities considered to have very high vulnerability in terms of cash access.

Almost 1,000,000 people in Spain live in municipalities that have medium vulnerability. On average they have 0.6 cash access points per 1,000 inhabitants, the average distance to these access points is 3 km, more than 35% of the population is over 60, and disposable income is below the national average. These municipalities have an approximate average population of 1,700. The provinces of Lugo, La Coruña and Orense in Galicia concentrate almost 24% of the population living in municipalities considered to have medium vulnerability.

Conclusions

The study reveals that the traditional cash access infrastructure in Spain has broad scope and offers widespread coverage, albeit with an uneven cross-regional geographical distribution. This means that part of the population living in less densely populated areas has no cash access point in their home municipality or within a 5 km radius. Should some of the existing access points close, the population affected would be substantially greater.

To assess the degree of vulnerability in terms of cash access, we construct an index that considers both supply and demand factors. The index identifies the municipalities that are at a higher risk of becoming financially excluded in terms of cash access. The findings show that in most of Spain vulnerability in terms of traditional access to cash is relatively low, although they also reveal that approximately 1,300,000 people may be considered vulnerable.

The number of bank branches and ATMs will foreseeably continue to fall in coming years, as digitalisation advances and credit institutions seek to achieve efficiency gains. In this respect, promoting alternative solutions to traditional channels may be an important complement, to ensure that the population as a whole continues to have access to cash, even though, on account of their current limitations, these solutions cannot fully replace the range of services offered by the traditional channels.

4.8.2021.

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ANNEX 1

Table A1.1

CASH ACCESS POINTS BY PROVINCE

Province	Number of cash access points	Degree of concentration	Population with no cash access points	Population with no cash access points (% of total)	Municipalities with no cash access points	Municipalities with cash access points
Álava	493	0.59	11,964	3.6	19	32
Albacete	639	0.53	9,958	2.6	27	60
Alicante	2,989	0.46	15,198	0.8	37	104
Almería	1,014	0.60	23,629	3.2	42	61
Asturias	1,487	0.42	8,639	0.8	11	67
Ávila	274	0.90	33,168	21.0	212	36
Badajoz	1,364	0.25	2,533	0.4	5	160
Balearic Islands	2,608	0.31	327	0.0	1	66
Barcelona	7,374	0.51	63,530	1.1	99	212
Burgos	633	0.89	49,122	13.7	311	60
Cáceres	590	0.71	58,149	14.8	135	88
Cádiz	1,393	0.17	0	0.0	0	45
Cantabria	789	0.58	31,333	5.4	39	63
Castellón	811	0.72	25,366	4.3	82	53
Ciudad Real	876	0.42	5,974	1.2	15	87
Córdoba	1,030	0.26	3,587	0.5	5	72
Coruña, La	1,465	0.32	14,409	1.3	8	85
Cuenca	472	0.78	24,539	12.5	163	75
Gerona	1,240	0.71	61,585	7.9	123	98
Granada	1,473	0.34	10,593	1.2	12	162
Guadalajara	336	0.93	31,953	12.2	246	42
Guipúzcoa	1,309	0.35	3,804	0.5	15	73
Huelva	714	0.39	5,175	1.0	15	65
Huesca	456	0.70	21,842	9.8	118	84
Jaén	994	0.21	620	0.1	1	96
León	723	0.80	75,460	16.5	143	68
Lérida	713	0.68	38,558	8.8	130	101
Lugo	483	0.28	2,072	0.6	3	64
Madrid	8,386	0.52	54,978	0.8	64	115
Málaga	2,654	0.44	14,962	0.9	21	82
Murcia	1,941	0.17	510	0.0	1	44
Navarre	1,190	0.77	41,783	6.3	145	127
Orense	418	0.45	25,870	8.4	26	66
Palencia	234	0.89	29,231	18.2	162	29
Palmas, Las	1,999	0.45	773	0.1	1	33
Pontevedra	1,079	0.20	1,073	0.1	1	60
Rioja, La	592	0.79	14,882	4.7	119	55
Salamanca	466	0.90	61,447	18.7	305	57
Santa Cruz de Tenerife	1,886	0.31	0	0.0	0	54
Segovia	281	0.84	30,511	19.9	160	49
Seville	2,303	0.26	3,125	0.2	2	104
Soria	179	0.89	11,443	12.9	150	33
Tarragona	1,120	0.64	45,425	5.6	91	93
Teruel	305	0.73	13,237	9.9	145	91
Toledo	938	0.50	23,082	3.3	46	158
Valencia	3,589	0.54	66,181	2.6	99	167
Valladolid	726	0.85	33,630	6.5	173	52
Vizcaya	1,814	0.44	14,368	1.2	26	86
Zamora	279	0.88	47,354	27.8	201	47
Zaragoza	1,430	0.69	20,899	2.1	160	133
Ceuta	74	0.00	0	0.0	0	1
Melilla	67	0.00	0	0.0	0	1
Total	**68,692**	**0.70**	**1,187,851**	**2.5**	**4,115**	**4,016**

SOURCES: INE, Euronet, Cardtronics, Euro Automatic Cash and Banco de España.

ANNEX 2

Table A2.1
PRINCIPAL COMPONENT ANALYSIS

	PC1	PC2	PC3	PC4
Weight of variables				
Access points per 1,000 inhabitants	-0.4779	0.5424	-0.4915	0.4856
Distance (km)	0.6266	-0.1993	-0.0903	0.7480
Proportion of population over 60	0.5518	0.3263	-0.6215	-0.4504
Disposable income	-0.2728	-0.7481	-0.6034	-0.0436
Relevance of components				
Standard deviation	1.4217	1.0840	0.7251	0.5270
Proportion of variance	0.5053	0.2938	0.1315	0.0694
Cumulative variance	0.5053	0.7991	0.9306	1.0000

SOURCE: Banco de España.

Table A2.2

PERCENTAGE OF POPULATION BY LEVEL OF VULNERABILITY

Province	High	Medium	Low	Very low
Álava	0.1	3.1	87.1	9.7
Albacete	1.6	2.8	27.5	68.1
Alicante	0.1	3.0	23.5	73.5
Almería	0.9	4.3	12.6	82.3
Asturias	0.4	1.1	30.4	68.2
Ávila	13.6	10.2	24.4	51.8
Badajoz	0.2	1.6	36.3	61.9
Balearic Islands	0.0	0.0	0.2	99.8
Barcelona	0.0	0.2	1.2	98.6
Burgos	4.1	6.7	5.0	84.2
Cáceres	7.7	11.5	30.4	50.4
Cádiz	0.0	0.2	12.8	86.9
Cantabria	1.0	3.6	18.5	76.9
Castellón	1.6	2.7	7.9	87.8
Ciudad Real	0.7	0.8	25.4	73.2
Córdoba	0.1	0.9	47.7	51.3
Coruña, La	0.5	7.0	38.0	54.6
Cuenca	8.4	4.9	22.4	64.3
Gerona	0.0	1.1	7.8	91.1
Granada	0.1	1.7	23.8	74.4
Guadalajara	4.6	3.3	5.0	87.2
Guipúzcoa	0.0	0.0	37.4	62.6
Huelva	0.0	1.5	33.3	65.2
Huesca	1.5	7.5	10.8	80.2
Jaén	0.0	0.4	50.0	49.6
León	7.8	9.8	14.4	68.0
Lérida	0.6	5.9	9.4	84.0
Lugo	0.6	26.4	40.0	32.9
Madrid	0.0	0.3	0.4	99.3
Málaga	0.0	1.5	9.7	88.8
Murcia	0.0	0.0	8.6	91.4
Navarre	0.5	5.0	79.8	14.6
Orense	4.9	27.2	29.1	38.8
Palencia	9.1	7.3	12.0	71.7
Palmas, Las	0.0	0.1	3.1	96.9
Pontevedra	0.1	3.0	38.2	58.7
Rioja, La	1.0	3.6	3.7	91.7
Salamanca	10.6	8.9	14.7	65.8
Santa Cruz de Tenerife	0.0	0.4	12.8	86.8
Segovia	3.2	9.2	12.7	74.8
Seville	0.1	0.0	16.5	83.4
Soria	8.6	5.3	18.9	67.2
Tarragona	0.1	3.4	10.4	86.2
Teruel	5.4	4.9	23.4	66.3
Toledo	0.4	3.1	29.8	66.7
Valencia	0.2	1.2	10.9	87.7
Valladolid	2.5	3.9	2.9	90.6
Vizcaya	0.0	0.7	74.9	24.5
Zamora	18.7	17.1	12.3	52.0
Zaragoza	1.0	1.2	7.0	90.8
Ceuta	0.0	0.0	0.0	100.0
Melilla	0.0	0.0	0.0	100.0
Total	0.7	2.1	16.5	80.7

SOURCE: Banco de España.

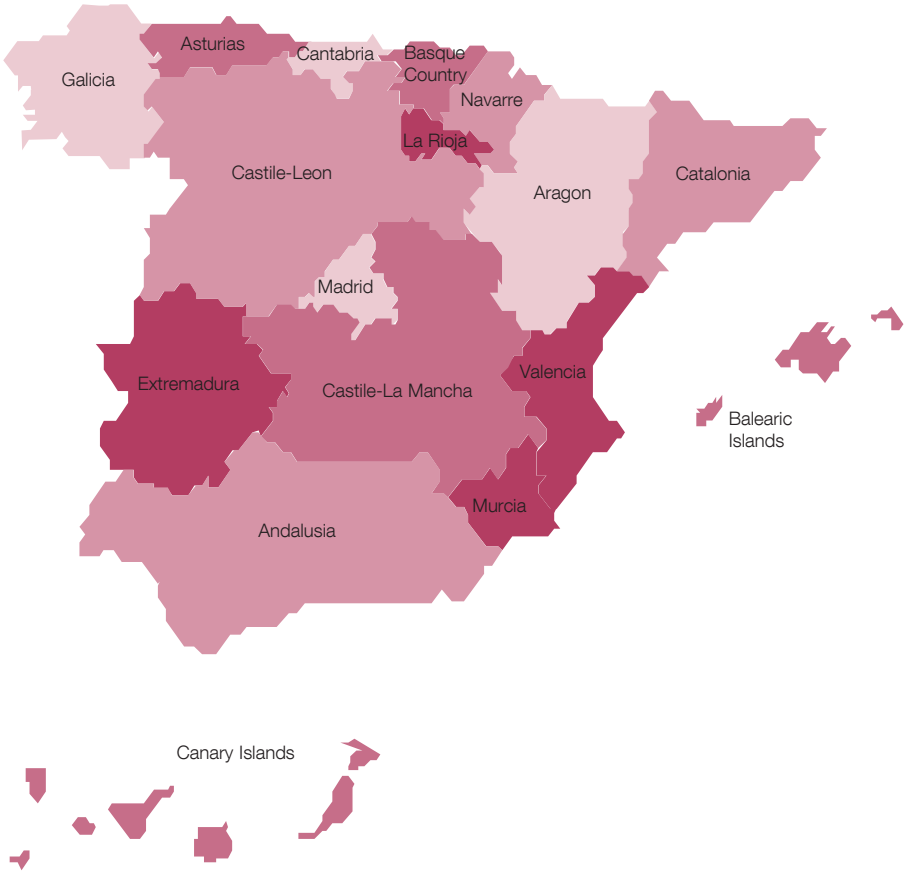
ANNEX 3

Chart A3.1
SPANISH PROVINCES

SOURCE: Banco de España.

Chart A3.2

SPANISH REGIONS



SOURCE: Banco de España.