Do public subsidies have an impact on start-ups survival rates? An assessment for four cohorts of firms set up by previously unemployed entrepreneurs in France

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Abstract – Business start-up assistance has been adopted as a tool for implementing proactive employment policies across most OECD nations. In France, the ACCRE start-up support programme for unemployed people creating or taking over firms has expanded strongly since its introduction in 1979. The number of people joining the ACCRE programme exceeded 80,000 in 2006 and peaked at 220,000 in 2010. We have studied the effect of the ACCRE system on the survival (measured after five years) of four cohorts of firms started by unemployed entrepreneurs in 1994, 1998, 2002 and 2006, based on survey data in INSEE's "new firms information system", SINE. According to descriptive statistics, the survival outlook for firms created by ACCRE beneficiaries is better than that of firms created by non-recipients. However, using simultaneous equations to model ACCRE approval and firm survival revealed evidence of ACCRE recipient selection based on the administrative approval process, as well as self-selection by entrepreneurs. Adjusted accordingly, ACCRE appears to have no effect on the survival of supported firms for most categories of unemployed people.

JEL codes: C26, D21, H25, J68, L38
Keywords: start-up, firm demographics, employment policy, support for the unemployed, public policy assessment

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In recent decades, economists and public employment policy authorities have increasingly focused on business start-ups and closures. In developed economies, firm turnover (entry and exit) rates tend to be high. This rapid turnover of firms is generally associated with the process of "creative destruction" as developed by the economist Schumpeter in the early 1940's. According to this theory, creative destruction is a continuous process in contemporary economies, resulting in the simultaneous creation of innovative new activities and loss of obsolete activities. In this framework, start-ups are essential agents of the creative destruction process acknowledged as a key economic growth driver (Aghion et al., 2014). A large body of empirical research on this theme has been documented since the 1980-1990's, revealing the considerable impact of new firms – including both start-ups (less than three years old) and young firms (less than five years old) more generally – on employment dynamics in developed European countries and in the United States (cf. Audretsch & Mahmood, 1994; Davis et al. 2007; Haltiwanger, 2011; Haltiwanger et al. 2013; Mata & Portugal, 1994). Drawing on a database produced for the purpose by the OECD (http://www.oecd.org/fr/sti/dynemp.htm), Criscuolo et al. 2014 demonstrate that, in small and medium-size enterprises (up to 250 employees), young firms (created in the past five years) "make a disproportionately high contribution to job creation" in the 18 studied countries[1], corroborating recent research using American data (Haltiwanger et al., 2013). Furthermore, most of these jobs are created by the entry of new firms, and to a lesser extent by growth within start-ups.

These research findings have significant implications for employment policy. Public support to start-ups has gradually been incorporated into proactive labour market policies across the European Union[2] and in most OECD countries, generally aimed at enabling the unemployed to re-enter the labour market. Start-up support policies must empower unemployed individuals, who often have few qualifications and are in some cases subject to discrimination, to set up a firm and hence create their own employment, by helping them to overcome the initial hurdles associated with entrepreneurship. If this aim is met, such policies should improve entrepreneurs' employability and human capital. Other arguments also plead in favour of such policies: they can yield a "double dividend" when these new firms go on to create additional jobs. Lastly, they can positively impact economic growth, by contributing to innovation and the spill over of new technologies. Nevertheless, such start-up support policies are subject to serious criticisms. Firstly, they may have deadweight effects in cases where entrepreneurs would have started their firm with or without a subsidy. The survival and success of the firm are unrelated to the subsidy in such cases. They can create crowding out effects, by distorting competition between existing firms and subsidised start-ups. They may also lead to inverse selection effects in the context of high economic uncertainty, for example by facilitating entrepreneurship among individuals who lack the ability to manage their firm over the short-to-medium term. Conversely, by lowering barriers to entry, such policies may reveal to individuals that they do indeed possess the necessary capabilities to run their own firm. Lastly, such subsidies may lead to moral hazard. Subsidised entrepreneurs may be tempted to invest less effort, as they would not bear the costs and/or lost income associated with the failure of their firm.

Caliendo (2016) highlights that most studies relating to the impact of publicly-funded start-up support programmes aimed at the unemployed population in OECD countries are descriptive in nature, with only a small body of research devoted to medium- to long-term assessment. Caliendo notes that studies tend not to be convergent, due to the heterogeneous nature of the institutional provisions in different countries, and the wide range of statistical and econometric methods used[3]. Regarding Germany, Caliendo and Künn (2011) compared two start-up support programmes (concerning unemployment benefit and subsidies) over the period 2003-2008. Using propensity score matching methods, the authors show that the two programmes had significant positive impacts on participant employment and revenue after five years, particularly for the previously long-term unemployed. The two programmes were merged into one in August 2006; a recent assessment (Caliendio et al.,

1. Austria, Belgium, Canada, Costa Rica, Spain, USA, Finland, France, Hungary, Italy, Japan, Luxembourg, Norway, New Zealand, Netherlands, Portugal, United Kingdom and Sweden, and Turkey for the period 2001-2011.

2. See expenditure on each type of initiative, and in particular incentives for starting new firms, on the Eurostat website, in the table [lmp_expsumm].

3. Regarding assessments of the various national programmes, refer to Caliendo & Künn (2011), Caliendo et al. (2015) and Pfeiffer & Reize (2000) for Germany, Deidda et al. (2015) for Italy, Gu et al. (2008) for the USA, and the summary by Caliendo (2016).

2015) indicates that, based on a propensity score matching method, the 19-month survival rate of subsidised firms was higher than other firms. However, they delivered weaker performance in terms of growth, innovation and income, due to negative inverse selection and moral hazard effects. In France, following the introduction in 1994 of Insee's information system on new firms, *SINE*, a survey which enables to analyse entrepreneurs' profiles and launch conditions, as well as the growth conditions of new firms, the implemented start-up public support programme was subjected to a variety of assessments. Most of these focussed on survival and economic performance. Crépon and Duguet (2003) studied the effect of public support (of all kinds) on business creation, considering a three-year period for a cohort of firms started in 1994. Using a selective matching method based on observable variables (propensity score matching), they revealed a significant positive impact of public support on the survival of firms created by the previously unemployed. Furthermore, access to bank loans greatly enhanced the probability of survival of these firms when combined with public support. Cabannes and Fougère (2012 and 2013) used data from the *SINE* survey to assess the effect of ACCRE (a support programme for unemployed people creating or taking over firms) on firm lifetimes, considering a five-year period for a cohort of firms established in 1998. They took into account endogeneity in ACCRE grant and estimated a model with random effects featuring two simultaneous equations, one relating to ACCRE grant (*logit*), the other formalising the life duration of the firms in the 1998 cohort. This approach revealed that the causal effect of ACCRE on the five-year survival rate of firms set up in 1998 by individuals who had previously been unemployed for a year or less was negligible (not significantly different to zero).

Désiage et al. (2010) and Duhautois et al. (2015) built a database merging the 1998 *SINE* survey with firm-related data from administrative files (*FICUS* unified accounting files) and examined the survival rate for firms during the first eight years of their lives. The population of entrepreneurs receiving ACCRE was larger than that studied by Cabannes & Fougère, as it included all ACCRE recipients, including short- and long-term unemployed individuals as well individuals who were not in the labour force before starting their business. Using a Rubin-like propensity score matching method, they found that ACCRE had a significant causal effect on the five- and eight-year survival rates of supported firms

Our study aims to assess the effect of ACCRE on the five-year survival rates of cohorts of firms created by recipients of this support in 1994, 1998, 2002 and 2006, respectively. These years correspond to the first four *SINE* surveys conducted by Insee. Our approach offers two advantages compared with previous studies. Firstly, as each survey covers all firms created during the first half of the reference year (Box 1), the characteristics of ACCRE recipients may be compared, using the same variables, against those of non-recipient entrepreneurs, which is not the case in many studies covering other countries, where such surveys are not carried out[4]. Secondly, in contrast to previous assessments conducted for France, the availability of four different cohorts enables us to assess any change over time in the causal effect of this support on firm survival rates, allowing to account for changing regulations. Lastly, our results, obtained using a methodology similar to that of Cabannes & Fougère (2012), corroborate and generalise theirs, highlighting the lack of a significant impact of ACCRE on three- and five-year firm survival rates.

Our article is organised as follows. The first section presents the regulations governing ACCRE in France, and the changes made to the programme since it was introduced in 1979; it also examines the numbers of recipient entrepreneurs for each cohort of new firms. The second section describes the variables included in the four cohorts of firms based on *SINE* databases, and identifies the survival indicators for the firms in those four cohorts, distinguishing whether or not they received assistance through ACCRE. The third section addresses the econometric assessment strategy for estimating the causal effect of ACCRE on the survival of recipient firms. The fourth section of the study estimates this effect for entrepreneurs who had been unemployed for less than a year when they started their firm. The next section focuses on assessing the effect for other categories of entrepreneur (i.e. not in the labour force or unemployed for more than a year). The final section tests the robustness of the estimates.

4. *This point is underscored by Caliendo (2016) p. 9.*

Changes to ACCRE regulations and the recipient population

ACCRE eligibility criteria

The ACCRE programme has seen multiple regulatory changes since it was first introduced (Table 1). These changes concern the eligible population, the nature of the support granted to entrepreneurs and the granting criteria. Initially, in 1979, it was an "over-the-counter" measure granted automatically to all job seekers receiving unemployment benefit (Mouriaux, 1995). With effect from 1987, the French labour authorities were empowered to reject projects that it considered to be non-viable. A departmental committee reporting to the Department of Work (*direction du travail*) was set up in the late 1980's to evaluate the authenticity and content of candidate projects.

The nature and extent of the available support have also varied in response to changing budget policy (figure). The five-year planning Act of December 1993, which was not effectively implemented until 5 April 1994, marked a break from the previous system. ACCRE eligibility was extended to all job seekers, regardless whether they were currently receiving unemployment benefit or not (although recipients were required to have been unemployed for six months). Most importantly, the fixed subsidy was made the same for all recipients, and was increased to FRF 32,000 with effect from the second quarter of 1994. The generosity and egalitarian nature of the system led to an immediate spike in the number of new ACCRE recipients, starting in Q2 1994 and continuing into 1995 and 1996 (see the figure in online supplement C1). However, the high budget cost of ACCRE prompted the government to strip the FRF 32,000 payment in its 1997 Finance Act (Daniel & Mandelblat, 2010). The new system – phased in beginning in 1998 – was only truly useful for unemployment benefit recipients who continued to receive part or all of their unemployment allowance for a period of up to 15 months (on condition that they were not remunerated by their new business). Furthermore, if their firm were to fail during that period, the entrepreneur would recover their unemployment benefit entitlement, calculated with effect from the date that they started their firm. Job seekers not receiving unemployment benefit qualified only for an exemption from national insurance contributions on any remuneration received during the first year, subject to a cap of 1.2 times the guaranteed minimum wage (SMIC). However, with effect from July 1998, new anti-discrimination legislation (*loi contre les exclusions*) extended eligibility for ACCRE support to new categories of entrepreneurs, without altering the nature or amount of the subsidy (Table 1).

Beginning in 2007, several root-and-branch regulatory reforms relating to business start-ups and related assistance were implemented. First, with effect from January 2007, ACCRE support has been awarded on the basis of purely administrative criteria relating to regulatory compliance (Daniel & Mandelblat, 2010; Ould Younes, 2010) and, beginning in September of the same year, the business registration centre (*Centre de formalités des entreprises*) took over application processing. The indicators assessing the economic viability of planned start-ups were discarded. The number of ACCRE recipients increased sharply as a result (Figure). Furthermore, the new "*autoentrepreneur*" self-employment regime came into effect in January 2009. The benefits of this regime include minimal paperwork when setting up a firm as well as special tax treatment. It appealed to large numbers of people with small-scale projects, with a knock-on effect on the characteristics of the entrepreneurs included in the 2010 SINE survey, compared with the cohorts initiated in 2002 and 2006 (Béziau & Bignon, 2017). As a result of these radical changes, we have chosen to end our analyses with the cohort initiated in 2006, i.e. before the viability criteria previously applicable to ACCRE grant applications were removed (in 2007), and before the *autoentrepreneur* self-employment regime was introduced (in 2009).

Entrepreneurs potentially concerned by ACCRE

For the purposes of this article we use the term "short-term unemployed" to refer to entrepreneurs who had been unemployed for less than a year prior to starting their firm; "long-term unemployed" to refer to those who had been unemployed for at least a year prior to starting their firm; and "out of the labour force" for those who reported that they had no job and were not seeking employment at the time (this category typically includes students and people receiving minimum welfare benefits who have reported that they were not seeking employment).

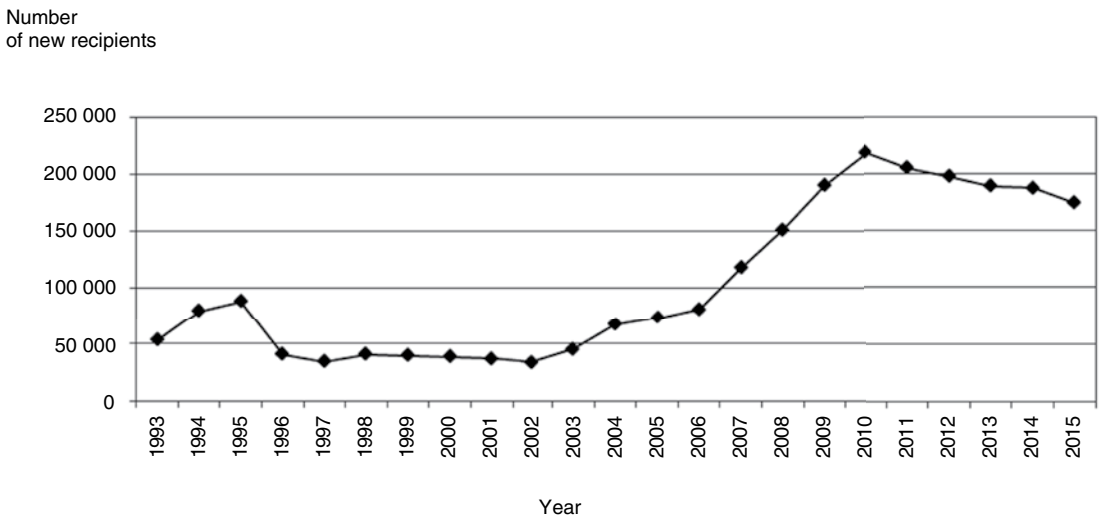
Table 1
The ACCRE programme: conditions of eligibility and support - Regulatory changes

Period	Eligible population	Nature of support	Award conditions and procedure
Prior to April 1994 (Act 80-1035 of December 1980; Decree 87-202 of 28 March 1987)	Unemployment benefit and minimum social welfare (RMI/ASS) recipients.	- Lump sum calculated based on the daily ASS social welfare payment for job seekers whose entitlement to unemployment benefits has expired. - Lump sum calculated based on residual unemployment benefit entitlement, capped at six months, for unemployment benefit recipients. - Six-month exemption from national insurance contributions for unemployment benefit recipients. ASS recipients: entitlement to ASS payments maintained for one year, in addition to any income generated by the firm, capped at 50% of the guaranteed minimum wage (SMIC). ASS payments are tapered if business income exceeds this level. RMI recipients: Only 50% of income generated by the firm is taken into consideration when calculating the resources on which RMI welfare payment amounts are based	Recipients must either start or take over a firm (regardless of activity sector or legal form) and effectively run that business. Application to be submitted to the departmental Department of Work (DDT) before the firm begins operating. A departmental committee evaluates the authenticity and content of candidate projects.
From April 1994 (entry into effect of the December 1993 five-year planning Act)	As above, plus job seekers registered as unemployed for more than six months but not receiving unemployment benefit.	- Same subsidy amount for all recipients: FRF 32,000. - Exemption from national insurance contributions for 1 year for unemployment benefit recipients and RMI and ASS minimum social welfare recipients; no exemption for job seekers not receiving unemployment benefit.	As above
First half of 1998 (1997 Finance Act).	As above, plus recipients of other social welfare payments for single parents (API) or the registered disabled.	- FRF 32,000 subsidy discontinued. - Exemption from national insurance contributions on the entrepreneur's pay for 1 year for unemployment benefit recipients and non-recipients, capped at 1.2 times guaranteed minimum wage (SMIC), and for RMI and ASS minimum social welfare recipients. - Unemployment benefit recipients and social welfare recipients continue to receive payments and allowances for 12 to 15 months if they are not remunerated by their new firm. In case of failure of their firm during that period, entrepreneurs recover their unemployment benefit entitlement, calculated with effect from the date that they started their firm. - All ACCRE recipients are issued with "consulting cheques" that can be used to pay for the services of approved experts.	As above
From H2 1998 to September 2007 (Planning Act of July 1998: anti-discrimination measures; Act 2003-721 of 1 August 2003 relating to business initiatives.	From July 1998: As above, plus holders of start-up support agreements, employees taking over their current employer in administration or liquidation proceedings, and under 26 year-olds eligible for the youth employment programme "*emplois jeunes*".	The ACCRE calculation method remained unchanged from H1 1998 to H1 2006. The Act of 1 August 2003 relating to business initiatives does not concern the ACCRE programme but made it easier to start a business by offering business owners additional guarantees (including protection against seizure of their home and tax relief).	As above
Decree 2007-1396 of September 2007	Same recipients as previously.	Nature of the assistance unchanged from previous provisions.	Radical changes to the ACCRE award procedure. With effect from January 2007, the award decision is based exclusively on administrative criteria, and since September 2007, applications are processed by business registration centres (CFE).

Source: Charpail (1995), Charpail (1996), Daniel & Mandelblat (2010), Guimiot & Mareau (2003), Mouriaux (1995), Ould & Younes (2010).

The share of ACCRE recipients among unemployed and non-working entrepreneurs (Table 2) appears to be strongly influenced by the changes in allocation rules analysed above (Table 1). The system introduced in 1994, at the time relatively generous to entrepreneurs, was subsequently greatly restricted, beginning in 1996-1997. The benefits of ACCRE support

Figure
Recipients of ACCRE start-up support



Note: Annual total of new recipients.
Coverage: Metropolitan France.
Source: DARES, *Poem* statistics database, available from http://poem.travail-emploi.gouv.fr.

were decreased, reducing the incentive to apply. However, for the cohorts of firms started in 2002 and 2006, the legislative changes that gradually expanded the population of eligible entrepreneurs resulted in recipients accounting for a significantly larger share of unemployed and out of the labour force.

The ACCRE programme accounts for the lion's share of the public support available to unemployed and out of the labour force entrepreneurs (Table 2). Apart from ACCRE, entrepreneurs may be eligible for local and regional subsidies, business tax exemptions and relief on national insurance contributions. All these forms of assistance are open to employed as well as unemployed and out of the labour force entrepreneurs. In certain cases, unemployed and out of the labour force entrepreneurs may be able to combine them with ACCRE. Ultimately, following a short break during the period extending from Q2 1994 to the end of 1996, when ACCRE payments were the same fixed amount for all categories of recipient, subsidies have been calculated based on the unemployment benefits or minimum social welfare payments made to unemployed or out of the labour force entrepreneurs. The revised legislation introduced great inequality between the financial benefits granted to the various groups of recipients.

Data and indicators used to assess survival rates among firms in the four cohorts

The data used in this study is drawn from Insee's "new information system on firms," *SINE*; it relates to cohorts of firms started in 1994, 1998, 2002 and 2006. Statistical methods and standardised concepts can be used to compare the four cohorts, subject to certain precautions, as described in Box 1.

Firm survival rates with and without ACCRE

Our chosen performance indicator is the survival rate of firms five years after creation. This rate is defined as the ratio of the number of firms created during the first half-year of the specified period and still trading five years later to the total number of firms created at the start of the specified period. Table 3 reveals that the firm survival rate for entrepreneurs who were working immediately prior to setting up their firm (whether as employees, traders, tradesmen, business owners or in the liberal professions) was an average of 5 to 7 percentage points

Table 2
Previously unemployed or out of the labour force recipients of the ACCRE programme in the four *SINE* surveys

In %

	1994	1998	2002	2006
Unemployed and out of the labour force as a share of all entrepreneurs	43.3	49.0	50.8	50.8
Among unemployed and out of the labour force entrepreneurs:				
- Recipients of public start-up support (of any kind)	51.7	38.8	47.7	65.4
- ACCRE recipients	n.d	30	40	59.0
Among short-term unemployed:				
- Recipients of public start-up support (of any kind)	69.2	49.5	58.5	76.2
- ACCRE recipients	n.d	40.1	51.6	70.8
Among long-term unemployed:				
- Recipients of public start-up support (of any kind)	59.7	47.5	59.7	75.6
- ACCRE recipients	n.d	39.4	52.8	69.8
Among out of the labour force entrepreneurs:				
- Recipients of public start-up support (of any kind)	6.7	13.4	18.2	27.9
- ACCRE recipients	n.d	5.4	11.2	18.3

Note: "short-term unemployed" refers to individuals who had been unemployed for less than a year when they started their business; "long-term unemployed" refers to individuals who had been unemployed for a year or more when they started their business; n.d: not determined. Calculations relating to the entrepreneur database; data weighted using the *poidsini* variable (Box 1).
Coverage: firms in non-farm private sectors established during the first half of the reference year, in metropolitan France except Corsica.
Source: Insee, *SINE* surveys 1994, 1998, 2002 & 2006.

Table 3
Mean survival rate among firms in the four surveys, according to the status of the entrepreneur immediately prior to start-up

In %

Year	Previously employed entrepreneurs	Previously unemployed or out of the labor force entrepreneurs		
		Total	ACCRE recipients	Not recipients of ACCRE
1994 cohort				
3-year survival	57.6 [57.0 ; 58.2]	52.7 [52.0 ; 53.4]	54.1 [53.1 ; 55.2]	51.8 [51.0 ; 52.6]
5-year survival	44.3 [43.6 ; 45.0]	38.3 [37.8 ; 39.0]	42.0 [41.0 ; 43.0]	36.3 [35.5 ; 37.1]
1998 cohort				
3-year survival	68.8 [68.3 ; 69.3]	62.1 [61.6 ; 62.6]	70.2 [69.3 ; 71.0]	58.6 [58.0 ; 59.2]
5-year survival	55.0 [54.5 ; 55.5]	49.2 [48.7 ; 49.7]	59.2 [58.3 ; 60.0]	45.0 [44.4 ; 45.6]
2002 cohort				
3-year survival	72.3 [71.9 ; 77.7]	66.1 [65.7 ; 66.5]	67.2 [66.5 ; 67.9]	65.5 [64.9 ; 66.0]
5-year survival	58.4 [57.9 ; 58.9]	51.1 [50.6 ; 51.6]	53.0 [52.3 ; 53.7]	49.7 [49.1 ; 50.3]
2006 cohort				
3-year survival	70.8 [70.4 ; 71.2]	64.6 [64.3 ; 64.9]	65.9 [65.5 ; 66.3]	62.7 [62.2 ; 63.2]
5-year survival	n.d.	n.d.	n.d.	n.d.

Note: Author's calculations. Data weighted using the *poidsini* variable (Box 1). In square brackets: confidence interval at the 10% threshold calculated based on the studied rate's standard deviation; n.d.: not determined. For the cohort of firms started in 1994, this includes ACCRE and any other forms of assistance (Box 1).
Coverage: firms in non-farm private sectors established during the first half of the reference year, in metropolitan France except Corsica.
Source: Insee, *SINE* surveys 1994, 1998, 2002 & 2006.

Box 1

THE *SINE* SYSTEM

Every four years since 1994, Insee has conducted a start-up survey via the new information system on firms, *SINE*. Using this system, it is possible to analyse entrepreneur profiles and the circumstances in which new firms are started, as well as growth and headcount changes during the first five years in the lives of new firms. The approach is based on a survey of a sample of approximately one third of firms started during the first half of the reference year. The sample is generated from the SIRENE register of firms. Each cohort is monitored over a five-year period. Firms respond to a survey during the first, third and fifth years in existence. The scope of these surveys extends across all non-farm private sectors. The vast majority of new firms are microenterprises operating in the trade, repair and other services sectors. In the studied cohorts, 80% of firms had only one employee at start-up.

Our study includes only firms created *ex nihilo*, not pre-existing firms that were taken over or reactivated, rendering the four surveys comparable from this perspective. We define an *ex nihilo* creation as the establishment of a new firm recorded in the SIRENE register of firms. For the 2006 survey, we adopted the same definition, although this survey also included a variable that treated pre-existing firms reactivated with a different activity as "start-ups". We preferred not to include such reactivated firms, in order to maintain a uniform definition across all four cohorts. We also stripped out firms that had ceased trading by the time of the first SINE survey (concerning the first year of existence). Lastly, we disregarded firms located in the French overseas departments and Corsica. This is because the special tax regimes applicable to firms in these two regions might impact attitudes to ACCRE.

The survey plan was designed to ensure that each survey would be representative with regard to the Region, Activity Sector (Nes16) and "Ex nihilo or takeover" criteria. The weight of each stratum (region x sector x ex nihilo criterion) depends on the dispersion of the five-year survival rates in each stratum. A firm's weight *i* (*poidsini* variable in the survey) in a particular stratum is equal to the inverse probability of drawing an observation from the same stratum in the sample population, relative to the probability of drawing a firm from a particular stratum in the population (Cabannes & Fougère, 2012).

The four surveys used contain essentially the same variables. There is one major exception for the 1994 survey, in which the "public support" variable made no distinction between the various forms of assistance (including ACCRE), unlike subsequent surveys. For 1994, we have used this "public support" variable, which may be treated as a proxy for ACCRE: in particular, it reflects the statutory break that prompted a larger number of job seekers and minimum social welfare recipients to apply for ACCRE subsidies (Tables 1 and 2).

higher than for previously-unemployed or out of the labour force entrepreneurs. The discrepancy is essentially the same at the three and five year marks.

Furthermore, the three-year and five-year survival rates of firms started by entrepreneurs who were working immediately prior to their establishment rose strongly from 1994 to 2002, before falling back slightly. The survival rates of firms started by previously unemployed or non-working entrepreneurs obey the same trend: a strong increase in the first three cohorts, followed by a slight decrease. Lastly, according to these descriptive elements, firms created by ACCRE recipients have a significantly higher survival rate than those of non-recipients, particularly in the first two cohorts (after five years, the difference was 5.7 points for the 1994 generation and 14.2 points for 1998). This survival rate for supported entrepreneurs increased strongly in 1998, to such an extent that the five-year figure exceeded 59%. This is more than four points higher than for firms created by entrepreneurs who were in employment prior to starting their firm. For the final two cohorts, on the other hand, the difference in survival rates between subsidised and non-subsidised firms shrinks to just over 3 points, while still remaining significant.

Econometric strategy

One cannot discount the hypothesis that ACCRE recipients are not chosen randomly. Firstly, concerning the four studied cohorts, the French labour authorities may have targeted projects proposed by entrepreneurs apparently best qualified to sustain and grow their firm. ACCRE recipients are chosen in a selection process where their personal characteristics as well as those of their business project are examined. Furthermore, self-selection may be an issue, if certain applicants are better informed

and/or better able to complete the administrative formalities for obtaining the ACCRE subsidy. This would increase the probability of success of their application, and their breadth of information and ability to cope with complex administrative procedures may reflect personal characteristics that help to make a more capable business manager. In such cases, it may be these personal characteristics that account for the survival or life of an entrepreneur's firm, rather than the fact that they did or did not receive an ACCRE subsidy. However, adverse selection may also occur, by making it easier for capable individuals to set up and run a firm, by providing them with the necessary resources (Jovanovic, 1982).

Selection bias, choice and validity of instrumental-variables

In order to take such selection phenomena into consideration, using a methodology similar to that described by Cabannes & Fougère (2012, 2013), a firm survival rate or duration equation and an ACCRE distribution equation are estimated simultaneously. Inasmuch as any selection process would be partly based on non-observable variables (such as the detailed content of the project or the entrepreneur's personality and ability to manage a firm), a method based on instrumental variables is applied: one or more instruments are used that effect the probability that the entrepreneur receives the ACCRE, but have no effect on firm survival. We began by opting for a survival-oriented model rather than a duration model. Firm closure dates are not mentioned in the database for 1994, and are inaccurate for the 1998 cohort, whereas the annual data relating to cessation of activity after one, two, three, four and five years are included in all four bases (Box 2). One possible instrument is the indicator based on the quarter in which a firm was set up (Cabannes & Fougère 2012). The use of this instrument is supported by the following arguments:

- The ACCRE application must be submitted before the firm is created;

- The subsidy is deemed to be granted if the applicant has not received a notice of rejection within three months of their application;

- If the subsidy is granted, the recipient is required to create their firm within three months of approval (a firm is considered to have been created on the date on which it is recorded in the trade or firms registers).

The entrepreneur must therefore apply for ACCRE at least three months before they intend to start their firm. As the public funding allocation for ACCRE programme relates to both the State budget (payment of unemployment benefits for a year, funding for consultant advice relating to training for unemployed entrepreneurs) and the national social security budget (exemption from national insurance contributions), in a context of budgetary tightening, one may assume that the labour authorities are less restrictive during the first quarter of the current year (t) than in the final quarter of the preceding year (t-1). All other things being equal, one might expect firms started during the second quarter of the current year (t) to have a higher probability of receiving ACCRE support than those started during the first quarter. As the firms surveyed for each cohort were created during the first half of the year (Box 1), we initially tested the effect of creation during each of the six relevant months in the ACCRE distribution equation (equation 1 in Box 2). Grouping results by quarter proved to be relevant (showing that April, May and June mark a clear break with the preceding months). Ultimately, we adopted, as an instrumental variable, the dummy variable relating to start-ups born during the second quarter, with the expectation of a positive relationship between that variable and participation to the ACCRE programme.

The second instrument, used in several similar studies (Pfeiffer & Reize, 2000; Cabannes & Fougère, 2012) is an indicator of tension of the local employment market, defined as the ratio of the number of vacancies (V) to the number of unemployed (U). The geographical level chosen for France is the "*département*", which is the level on which ACCRE granting decisions are made by labour authorities. If the labour market in a *département* is slack (low V/U ratio), the probability of unemployed people finding paid employment is low, prompting the local administrative authorities to help them to move out of unemployment by encouraging firm creation. Accordingly, they tend to be less strict in granting ACCRE subsidies than in *départements* with a brighter employment situation. One can therefore expect a decreasing relationship between the V/U indicator and ACCRE granting. We have adopted the ratio of the mean monthly flows of new job vacancies and new job seekers over the course of the preceding year (t-1). This indicator takes into account possible delays by the administrative authorities in including labour market information.

Box 2

ECONOMETRIC METHOD

We have estimated a *biprobit* model featuring an equation of participation in the ACCRE programme and a five-year survival equation.

This model may be represented as follows, for an entrepreneur *i*.

$$ACCRE*_i = \beta' X_i + \delta' instr_i + \varepsilon_{1i} \quad (1)$$

$$SURV*_i = \alpha' X_i + \gamma ACCRE_i + \varepsilon_{2i} \quad (2)$$

$ACCRE*_i$ and $SURV*_i$ are latent variables respectively representing the scores of each entrepreneur *i*. These variables determine whether or not the entrepreneur received ACCRE support (1) and whether or not the firm was still trading after five years (2). The following selection rule applies:

$ACCRE_i = 1 \quad if \quad ACCRE*_i > 0$ and $ACCRE_i = 0 \quad if \quad ACCRE*_i \leq 0$

$SURV_i = 1 \quad if \quad SURV*_i > 0$ and $SURV_i = 0 \quad if \quad SURV*_i \leq 0$

X_i is a vector for the individual characteristics of the entrepreneur *i* and their project (e.g. age, nationality, gender, educational background, socioeconomic group prior to starting their firm, activity sector, start-up status, etc.).

$instr_i$ is a vector consisting of instrumental variables (two, in our model).

ε_{1i} and ε_{2i} are the error terms:

$$\begin{pmatrix} \varepsilon_{i1} \\ \varepsilon_{i2} \end{pmatrix} \longrightarrow N(0, \Sigma)$$

The error terms have a bivariate normal distribution (with a variance-covariance matrix formed with 1 along the principal diagonal, and the other elements in the matrix formed by the error term correlation coefficient). Where applicable, the correlation between error terms can be used to allow for unobserved heterogeneity.

The estimations were performed using the *Stata* software using the maximum likelihood method for the cumulative bivariate normal distribution function. Additionally, the regressions shown in the main text, appendices and online supplements were generated by weighting the observations *i* based on the *poidsini* variable (*pweight* procedure in *Stata*). As noted by Cabannes & Fougère (2012), this weight depends on the five-year survival dispersion in each stratum (Box 1), as a result of which, omitting the weight may introduce an endogeneity bias.

However, this instrument might be endogenous, having a proper effect on firm survival, or on an omitted variable that impacts survival rates. The reverse causality hypothesis, whereby surviving new firms would improve the local market conditions may be refuted. The chosen indicator of tension in the local labour market trails the actual creation of firms by a year. Furthermore, the possibility of a correlation between this instrument and the error term in the survival equation appears weak, even where entrepreneurs persevere in a barely profitable activity because of a lack of alternatives to persistent unemployment in the local labour market. Such a correlation could only occur if the labour market were durably degraded in the *département* over a period of five years following the creation date.

Inclusion of individual characteristics of entrepreneurs and their firms

We have used the wide array of variables available in the SINE survey, which relate not only to the observable characteristics of entrepreneurs but also to the economic characteristics of the firms they create (Box 1). These variables include the entrepreneur's gender, nationality, educational level, socioeconomic group prior to starting the firm, age, number of previous start-ups, as well as the firm's legal status, size and activity sector. We also used a dummy variable to reflect the effect (if any) of other forms of public assistance (Table 2). Regarding the financial resources invested in new firms, we created a dichotomous variable, assigning half of the firms in each cohort the "limited resources" value and the other half the "ample resources" value. Note that this variable does not include the ACCRE subsidy, which may be assimilated to either income (unemployment benefits paid to the entrepreneur for one year) or a cost saving (exemption from national insurance contributions) (Table 1). We declined to include the grant of bank loans to entrepreneur, due to the risk of selection bias with regard to survival rates. However, this article does examine the impact of incorporating this variable into our model on the results (see *infra*, Robustness of the estimation).

Impact of ACCRE on five-year survival rates of firms created by the short-term unemployed

To allow for the heterogeneous impact of ACCRE on the various categories of entrepreneurs (namely short-term unemployed, long-term unemployed or out of the labour force) at the time they start their firms, we initially focus on the short-term unemployed, a population in which entitlement to unemployment benefits (and hence ACCRE subsidies) is relatively uniform (Table 1). We then use a comparative approach to incorporate the other categories of recipients (long-term unemployed and people out of the labour force prior to starting their firms) into our estimations. Each *probit* equation was first estimated separately, and then the two were estimated jointly. Comparing the two sets of results provides insight into the existence of a selection bias in the participation in the ACCRE programme.

Estimation of a model of participation in the ACCRE programme (for the short-term unemployed)

Table A (in the appendix), which relates to entrepreneurs who had been unemployed for a short period prior to starting their firm, reveals that French citizens were more likely to participate in the ACCRE programme. It should also be noted that women are not discriminated against: in 2002 and 2006, all other things being equal, more women than men received the subsidy. Concerning education, unqualified applicants were markedly less likely to receive ACCRE assistance than those with basic general or vocational qualifications (BEP and CAP). However, applicants with baccalaureate or higher diplomas were not more likely to receive an ACCRE subsidy than the previous categories (except in 1998). Examining the entrepreneur's socioeconomic group prior to starting their firm clearly reveals the legal provisions governing the ACCRE granting process. Business owners, traders and tradesmen were less likely than executives to receive this support (except in 2006, although the results are hard to interpret as we were obliged to combine all non-employees in a single category). As they did not receive unemployment benefits, they had little incentive to apply for ACCRE. Students who had completed their studies and gone on to become entrepreneurs were in the same situation.

Furthermore, small projects with no employees were more likely to receive the subsidy than larger projects. Moreover, ACCRE support was often accompanied by other public subsidies (Table 2). In our estimations we allowed for this phenomenon by introducing a dichotomous variable (received/did not receive other public support) to account for the influence of such subsidies on firm survival. Concerning firm statuses, for all cohorts, firms structured as liberal professions, SARL or SA limited companies and partnerships, considered together, had a lower probability of receiving ACCRE subsidies than individual businesses. Two interpretations can be given for this. Firstly, the authorities may channel ACCRE support toward individuals with the lowest probability of finding employment, and/or who have fewer legal and financial resources than entrepreneurs setting up companies to implement their project, in accordance with the goals of the ACCRE legislation (see Table 1). However, a completely different hypothesis may also be advanced: individuals using complex legal arrangements are not company employees (for example, a non-salaried managing director paid out of operating profit), and as such have no incentive to apply for ACCRE (Daniel & Mandelblat, 2010). Concerning the financial resources invested when starting a business, firms (in all four cohorts) with relatively limited financial resources had a lower probability of receiving the subsidy than others.

Lastly, the variables reflecting local labour market tension and those indicating ACCRE awarded in the second quarter of the studied year, which are used as instruments when estimating the two-equation model, have an effect with the expected sign. (respectively < 0 in the first case and > 0 in the second) and are significant (at the 1% threshold in the first case, and 10% in the second). This result corroborates the rationale described above regarding the determining factors in the authorities' decision to grant ACCRE support.

Estimated five-year survival model (for the short-term unemployed)

Estimating the *probit* five-year survival equation (Table 4) shows that for the four cohorts of new firms, ACCRE support has a significant effect (at the 1% threshold) on five-year survival. This effect was the most pronounced in 1998, to such an extent that there was a significant difference (at the 1% threshold) between the estimated

coefficient for the ACCRE (Yes/No) dummy variable in 1998, on one hand, and those estimated for the cohorts of firms started in 2002 and 2006, on the other hand. Comparing these results with the descriptive statistics referred to earlier (Table 3) reveals a smaller difference in survival rates between firms with and without ACCRE subsidies in 2002 and 2006, compared with 1998.

Furthermore, the level of education and the socioeconomic group prior to starting the firm had a weak and in most cases non-significant effect on five-year survival rates. On the other hand, firms structured as companies or as liberal professions had better five-year survival prospects than individual businesses. In addition, other forms of regional and local subsidies for start-ups had no effect on five-year survival

Table 4
Estimation of the *probit* model with the dependent variable: Survived five years (Yes/No) – short-term unemployed entrepreneurs

Cohort	1994	1998	2002	2006
ACCRE (Yes/No)	0.30***[0.06]	0.50***[0.06]	0.16***[0.04]	0.14***[0.05]
Limited financial resources (*ref.* Ample resources)	- 0.32***[0.06]	- 0.25***[0.06]	- 0.17***[0.04]	- 0.25***[0.05]
French nationality (*ref*. Foreign)	0.26*[0.11]	0.47***[0.11]	0.11 [0.07]	0.27***[0.08]
Male gender (*ref*. Female)	0.05 [0.07]	0.12*[0.07]	0.16***[0.050]	0.042 [0.050]
Age group >50 (*ref.* 16 - 50)	0.13 [0.16]	0.13 [0.12]	- 0.04 [0.07]	0.077 [0.067]
Education, qualifications (*ref.* CAP/BEP vocational diplomas)				
No qualifications	- 0.16*[0.08]	- 0.12 [0.09]	- 0.11 [0.07]	- 0.09 [0.08]
BEPC secondary school certificate	included in BEP	- 0.13 [0.12]	- 0.09 [0.08]	- 0.20**[0.09]
Vocational baccalaureate (bac pro)	- 0.01 [0.08]	- 0.01 [0.10]	0.06 [0.070]	0.02 [0.08]
General baccalaureate	(Voc.+gen. bac.)	- 0.16 [0.13]	- 0.04 [0.08]	- 0.18*[0.10]
Higher education	0.01 [0.08]	- 0.12 [0.09]	0.10*[0.05]	0.05 [0.07]
Previous job category (*ref.* Executive)				
Business owner	0.11 [0.26]	- 0.18 [0.30]	0.30* [0.17]	- 0.27 [0.20] (all
Tradesman or trader	0.13 [0.18]	- 0.19 [0.16]	inc. business owners	non-employees)
Supervisory worker	0.01 [0.13]	- 0.03 [0.15]		- 0.04 [0.08]
Intermediate profession	- 0.06 [0.13]	- 0.21*[0.13]	0.12 [0.11] (all employees	- 0.11 [0.08]
Clerical worker	- 0.06 [0.09]	- 0.23**[0.10]	except	- 0.03 [0.07]
Manual worker	0.12 [0.10]	- 0.10 [0.10]	executives)	- 0.02 [0.07]
Student	- 0.17 [0.18]	- 0.26*[0.15]	0.07 [0.16]	(inc. all
Other/non-working	- 0.03 [0.16]	- 0.51***[0.15]	- 0.02 [0.12]	non-employees)
No employees (*ref.* One or more employees.)	0.18***[0.07]	- 0.07 [0.08]	0.05 [0.05]	- 0.02 [0.07]
Other public subsidies: Received other (*ref*. Did not receive)	n.d.	0.05 [0.10]	- 0.06 [0.05]	0.03 [0.05]
Legal form: Companies and liberal professions (*ref.* individual business)	0.40***[0.08]	0.16**[0.07]	0.21***[0.05]	0.34*** [0.05]
Constant	- 0.58***[0.20]	- 0.44***[0.18]	- 0.45***[0.15]	0.06 [0.15]
Number of observations	4,230	3,355	5,588	7,300
Log likelihood	- 9,111	- 6,875	- 7,840	- 13,516
Pseudo R^2	0.061	0.068	0.031	0.036

Note: Observations weighted using the SINE survey's *poidsini* variable (Box 1). The standard deviations of the regression coefficients, shown between square brackets, and their significance were calculated using the *robust* procedure with the Stata software. Asterisks indicate significance thresholds: 10% (*), 5% (**) and 1% (***), respectively. For the 2006 cohort, the survival variable was calculated after three years, as the five-year data was unavailable. Some control variables are not shown in the table: the dummy variables used to categorise firms in 6 activity sectors (NES16), the number of firms created prior to the studied one, whether the firm was created by a single entrepreneur or several, whether or not market research was conducted prior to start-up, and whether or not the firm was located in the Paris region.
Reading note: Receiving ACCRE support had a significant positive impact (at the 1% threshold) on the probability of survival after five years in the cohorts of firms started in 1994, 1998, 2002 and after 3 years for the 2006 cohort, all observable characteristics being equal. Conversely, starting a business with limited resources had a significant negative impact (at the 1% threshold) on the same survival probability across all cohorts.
Coverage: firms in non-farm merchant sectors established during the first half of the reference year, in metropolitan France except Corsica; authors' database limited to short-term unemployed entrepreneurs (unemployed for less than a year prior to starting their firm).
Source: Insee, *SINE* surveys 1994, 1998, 2002 & 2006.

rates. Lastly, the probability of survival of a firm after five years is lower where the entrepreneur has limited financial resources.

Impact of ACCRE on survival rates in a simultaneous equation-based model (short-term unemployed)

When estimating the model based on two simultaneous equations, the interdependencies between the variables in the two equations are included, and if the model is correctly formalised, enables the impact on five-year survival rates of any selection in the participation in the ACCRE programme to be eliminated. It was estimated using the maximum-likelihood method with the *Stata* software (Box 2). According to this estimation, for the short-term unemployed (Table 5), the impact of ACCRE on five-year survival was not significantly different to zero (at the 10% threshold) for the four cohorts. The result is therefore totally different from the previous result for the basic survival equation (Table 4). This clearly indicates a selection effect, compromising the effectiveness of the ACCRE programme as an economic policy tool intended to increase the five-year survival rate for the four cohorts of firms.

The estimated coefficients of the instrumental variables have an expected sign and are significant (at the 1% threshold for the departmental employment market tension variable, and at the 10% threshold for the variable indicating the quarter in which a firm is created). However, estimating the effect of departmental labour market tightness on the participation in the ACCRE programme reveals a break after 1998. The estimated coefficient was lower (at the 1% threshold) in 2002 and 2006, than in 1998. This may be interpreted as reflecting a shift in the selection process that diminished after 1998, whereas the proportion of unemployed entrepreneurs receiving ACCRE support was significantly higher in 2002 and 2006 than in 1998 (Table 2). A similar shift was observed in the estimated coefficients for the ACCRE (Yes/No) variable; the coefficients were significant at the 20% threshold for the cohorts of firms started in 1994 and 1998, but not for subsequent cohorts. From this perspective, the decrease in the apparent effect of ACCRE in the descriptive data (Table 3) may be interpreted as reflecting decreased selection, in turn linked to a wider availability of ACCRE to unemployed entrepreneurs.

Table 5
ACCRE as a determining factor in five-year firm survival – Estimation of the model featuring two simultaneous equations – Short-term unemployed entrepreneurs

Cohort	1994	1998	2002	2006
5-year survival equation:				
ACCRE (Yes/No)	0.19 [0.14]	0.18 [0.13]	- 0.07 [0.24]	0.03 [0.15]
ACCRE participation programme equation:				
Departmental labour market tightness	- 0.65***[0.23]	- 0.93***[0.20]	- 0.26**[0.12]	- 0.30***[0.07]
Firm created in Q2. (*ref.* Q1.)	0.10*[0.6]	0.08*[0.05]	0.13**[0.05]	0.07 [0.05]
Number of observations	4,230	3,355	5,588	7,300
Corr. residues from equations	- 0.23 [0.33]	- 0.13 [0.37]	0. 23 [0.60]	0.01 [0.27]

Note: maximum-likelihood estimations for the model calculated using the Stata software (Box 2). Observations weighted using the *SINE* survey's *poidsini* variable (Box 1). For the 2006 cohort, the survival variable was calculated after three years, as the five-year data was unavailable. The database was limited to short-term unemployed entrepreneurs (unemployed for less than a year prior to starting their firm). The standard deviations of the regression coefficients, shown between square brackets, and their significance were calculated using the *robust* procedure in the Stata software application. Asterisks indicate significance thresholds: 10% (*), 5% (**) and 1% (***), respectively. Some control variables are not shown in the table: the dummy variables used to categorise firms in 6 activity sectors (NES16), the number of firms created prior to the studied one, whether the firm was created by a single entrepreneur or several, whether or not market research was conducted prior to start-up, and whether or not the firm was located in the Paris region.
Reading note: Receiving ACCRE support had no significant positive impact (at the 10% threshold) on the probability of survival after five years in the cohorts of firms started in 1994, 1998, 2002 and after 3 years for the 2006 cohort, all observable characteristics being equal.
Coverage: firms in non-farm private sectors established during the first half of the reference year, in metropolitan France except Corsica; authors' database limited to short-term unemployed entrepreneurs (unemployed for less than a year prior to starting their firm).
Source: Insee, *SINE* surveys 1994, 1998, 2002 & 2006.

Lastly, the correlation between the residuals of the two equations is never significant. Based on this result, no unobserved variables linked both to participation in the ACCRE programme and firm survival rates appear to exist.

Impact of ACCRE on five-year survival rates among firms created by various categories of recipients

This section extends the analysis for short-term unemployed to cover other categories of entrepreneurs eligible to the ACCRE programme. We estimate our model based on two simultaneous equations for the population of entrepreneurs, including not only the short-term unemployed but also the long-term unemployed and individuals out of the labour force prior to starting their firm. We introduce a dummy variable into the two equations for each of the latter two categories, relative to the short-term unemployed. The goal was to assess whether including the two additional entrepreneur categories modified the impact of ACCRE on firm survival (Table 6).

Including the whole population of entrepreneurs eligible to the ACCRE programme multiplies the size of each cohort by a factor of between two and three. This increase makes it possible to get more accurate estimations for the coefficients for the two equations. Considering the results obtained by estimating the equation of participation in the ACCRE programme confirms that entrepreneurs out of the labour force were much less likely to receive ACCRE support than the short-term unemployed, which corresponds to the results yielded by the descriptive statistics (cf. Table 2). The probability of receiving ACCRE support by long-term unemployed entrepreneurs varied according to the cohort, being higher than for the short-term unemployed in 2002 and lower in 1994. Concerning firm survival, estimating the corresponding equation shows that the probability of firms created by long-term unemployed and entrepreneurs out of the labour force to still be active after five years was not significantly different from the short-term unemployed (except in the 2006 cohort, when the probability was lower for those out of the labour force).

Table 6
ACCRE as a determining factor in five-year firm survival – Estimation of the model featuring two simultaneous equations – Short-term and long-term unemployed and out of the labour force entrepreneurs

Cohort	1994	1998	2002	2006
5-year survival equation:				
- ACCRE (Yes/No)	0.11 [0.09]	0.23***[0.06]	0.06 [0.08]	- 0.09 [0.07]
- Recipient category (*ref.* Short-term unemployed)				
Long-term unemployed	- 0.01 [0.05]	- 0.12 [0.08]	- 0.03 [0.03]	- 0.02 [0.03]
Out of the labour force	0.08 [0.20]	0.13 [0.09]	0.11 [0.11]	- 0.21* [0.12]
ACCRE programme participation equation:				
- Recipient category (*ref.* Short-term unemployed)				
Long-term unemployed	- 0.19***[0.05]	0.04 [0.04]	0.09***[0.03]	0.02 [0.03]
Out of the labour force	- 1.65***[0.07]	- 1.12***[0.06]	- 1.13***[0.04]	- 1.38***[0.05]
- Departmental labour market tightness	- 0.56***[0.19]	- 0.74***[0.13]	- 0.31***[0.07]	- 0.21***[0.04]
- Firm created in Q2 (*ref*. Q1)	0.15***[0.05]	0.09**[0.04]	0.091***[0.031]	0.06*[0.03]
Number of observations	8,256	8,269	13,792	18,416
Corr. residues from equations	- 0.14 [0.22]	- 0.33* [0.16]	- 0.07 [0.18]	0.29 [0.15]

Note: maximum-likelihood estimations for the model calculated using the Stata software (Box 2). Observations weighted using the *SINE* survey's *poidsini* variable (Box 1). For the 2006 cohort, the survival variable was calculated after three years, as the five-year data was unavailable. The standard deviations of the regression coefficients, shown between square brackets, and their significance were calculated using the *robust* procedure in the Stata software application. Asterisks indicate significance thresholds: 10% (*), 5% (**) and 1% (***), respectively. Some control variables are not shown in the table: see table 4.
Reading note: 5-year survival equation - Receiving ACCRE support had no significant impact (at the 10% threshold) on the probability of survival after five years in the cohorts of firms started in 1994 and 2002, and after 3 years for the 2006 cohort, all observable characteristics being equal. There was a significant impact (at the 1% threshold) for the cohort of firms started in 1998.
Source: Insee, *SINE* surveys 1994, 1998, 2002 & 2006.

Ultimately, considering all categories of entrepreneur, ACCRE had no effect on firm survival, as was the case for short-term unemployed entrepreneurs, with the notable exception of the cohort of firms started in 1998. For this cohort, the ACCRE programme had a significant positive impact on survival (at the 1% threshold). An initial hypothesis is that this effect would be positive for long-term unemployed and out of the labour force entrepreneurs for the cohort of firms started in 1998. However, this hypothesis can be discounted, as it was shown to be false when our model was estimated for each of these entrepreneur categories separately. The larger sample size was the key factor responsible for the more accurate estimation. However, despite much larger samples in 2002 and 2006, as a result in the increase in the number of recipients (compare Table 6 and Table 5), the impact of ACCRE for these two cohorts was not significant (and was indeed negative for the 2006 generation). There was a break in terms of ACCRE's impact between the 1998 cohort and subsequent generations.

With effect from 2002, the percentage of unemployed and out of the labour force ACCRE recipients increased considerably (Table 2), attracting new categories of entrepreneurs. The relationship detected between ACCRE support and firm survival was negative (but not significant) for certain categories of entrepreneurs. Specifically, this was the case for short-term unemployed entrepreneurs in 2002 (Table 5) and all ACCRE recipients in 2006. Both the size and the nature of the ACCRE recipient population has changed. Beginning in the early 2000's, ACCRE increasingly resembled an additional welfare benefit, granted automatically to entrepreneurs based on purely administrative criteria. This situation was officially acknowledged in the Decree published in 2007 (Table 1). This extension to the relevant legislation may have prompted individuals to create a firm who would not otherwise have done so without the incentive offered by the ACCRE programme. In such a scenario, self-selection prompts more people to apply for the subsidy, although they may be less well qualified to start a firm than when the award criteria were stricter. Analysing the recipients of minimum social welfare benefits who started firms as part of the 2002 and 2006 cohorts corroborates this finding (see additional information on the online supplement C2).

Robustness of the estimations

Inclusion of financial variables

Thus far, we have included the financial resources invested at start-up (Tables 4 and A1-1), without isolating any bank loans available to firms. One cannot exclude the possibility of this variable being endogenous with regard to survival. Comparing the estimations of the two equations for short-term unemployed entrepreneurs according to whether or not the variable "financial resources available to the firm at start-up" is included in the model's two equations reveals that the coefficients are very similar, and in all cases, not significantly different to zero regarding the impact of ACCRE on firm survival (Table C4-1 in the online supplement). The same applies to the coefficients of the instrumental variables, which were not significantly changed. Moreover, when the variable "financial resources at start-up" was replaced with the variable "approved bank loan" in the same two equations, the results of the estimations[5] were not significantly different to our original estimation (Table 5). These results are important inasmuch as they demonstrate that the financial resources deployed have a significant effect on five-year survival (Table 4) but, according to this analysis, are independent of the ACCRE programme's impact on survival.

Does the business cycle have a differentiated effect on survival of subsidised and non-subsidised firms?

The issue of the impact of the analysis period on survival results must be addressed. Firm survival is indeed sensitive to changes in the business cycle. Jacobson et al. (2011), and Fougère et al. (2013) both find that the 2008 economic crisis had a major impact on business failures, albeit after a considerable delay, according to these authors, who claim that the effect of the crisis on failures did not become significant until 2009, subsequently growing in severity until late 2010, when their study ended. In this case, the goal is to determine whether the cycle exerts a differentiated effect on the impact of ACCRE on firm survival. Note that the *SINE* survey only relates to firms created during the first half-year in each cohort.

5. *Not discussed herein; available from the author.*

The first lesson to be drawn from Table 7 is that the comparative effect of ACCRE on the survival of firms started by the short-term unemployed after three and four years (two years in the case of the 2006 cohort) was not significantly different to the effect on survival after five years (three years in the case of the 2006 cohort). This generalises the validity of our previous five-year analyses for shorter timescales. ACCRE had no effect for the 1994, 2002 and 2006 cohorts. The cohort of firms started in 1998 differs from the others, as this effect, which was not significant at the 10% threshold for five-year survival, was significant for the four- and three-year timescales. However, the coefficients and standard deviations associated with the corresponding three regressions reveal that these differences between coefficients are not significant. We stand by our original assessment that ACCRE had a weak effect, at all timescales, on the cohort of firms started in 1998 by short-term unemployed entrepreneurs.

In the light of these results, no significant influence of the unemployment cycle on the effect of ACCRE support on firm survival can be established. For example, for the cohort of firms started in 1998, the lower limit of the unemployment rate during the period from the first half of 2001 to the first half of 2002 was followed by a rise in early 2003 (see Figure C4-I in the online supplement). Can the slight fall in the estimated coefficient of the effect of ACCRE after five years, relative to previous years, be interpreted as a consequence of the deterioration in the employment market? We do not believe so, as this fall was not significant with respect to previous years. Furthermore, the aforementioned studies reveal a delay of months or half-years between the shift in the cycle and business failures, implying that if such an effect existed, it would be felt in subsequent years.

For the cohort of firms started during the first half of 2002, a surge in unemployment was observed in the second half of 2005 and the first

Table 7
Impact of ACCRE on firm survival after 3, 4 and 5 years - Estimation of a two-simultaneous equations model – Short-term unemployed entrepreneurs

	Survival equation: impact of ACCRE on survival	ACCRE participation equation: impact of labour market tension variable	ACCRE participation equation: impact of Q2 award variable
1994 cohort			
3 years	0.17 [0.18]	- 0.66***[0.23]	0.08*[0.05]
4 years	0.17 [0.13]	- 0.64***[0.23]	0.09*[0.05]
5 years	0.19 [0.14]	- 0.65***[0.24]	0.10*[0.06]
1998 cohort			
3 years	0.20*[0.11]	- 0.94***[0.20]	0.08*[0.05]
4 years	0.20*[0.12]	- 0.94***[0.20]	0.07*[0.04]
5 years	0.18 [0.13]	- 0.93***[0.20]	0.08*[0.05]
2002 cohort			
3 years	0.08 [0.32]	- 0.30**[0.14]	0.10*[0.06]
4 years	0.10 [0.23]	- 0.31***[0.11]	0.09*[0.05]
5 years	0.07*[0.24]	- 0.26**[0.12]	0.13*[0.05]
2006 cohort			
2 years	0.03 [0.11]	- 0.30***[0.06]	0.09*[0.05]
3 years	0.03 [0.15]	- 0.30***[0.07]	0.07*[0.05]

Note: maximum-likelihood estimations for the model calculated using the Stata software (Box 2). Observations weighted using the *SINE* survey's *poidsini* variable (Box 1). For the 2006 cohort, the survival variable was calculated after three years, as the five-year data was unavailable. The database was limited to short-term unemployed entrepreneurs (unemployed for less than a year prior to starting their firm). The standard deviations of the regression coefficients, shown between square brackets, and their significance were calculated using the *robust* procedure in the Stata software application. Asterisks indicate significance thresholds: 10% (*), 5% (**) and 1% (***), respectively. Certain control variables are not shown in the table: see table 4. Only the relevant variables are shown in the table.
Reading note: Receiving ACCRE support had no significant positive impact (at the 10% threshold) on the probability of survival after three, four and five years in the cohorts of firms started in 1994 and 2002. Neither did it impact the probability of survival of firms set up in 2006 after two and three years. For 1998, a positive effect on three- and four-year survival was observed (at the 10% threshold).
Source: Insee, *SINE* surveys 1994, 1998, 2002 & 2006.

half of 2006, followed by a slight improvement in 2007. Can the negative coefficient of the effect of ACCRE on five-year survival (2007) be interpreted as a delayed effect of the unemployment surge in the preceding two years? The coefficient is too weak to affirm such a relationship. For the cohort of firms started in 2006, unemployment reached a trough in the first half of 2008 before increasing sharply in the first half of 2009. Based on our estimations, this sudden upturn in unemployment did not affect the impact of the ACCRE programme, at least in the short term.

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Our research regarding the effectiveness of the ACCRE programme as a measure for improving the five-year survival prospects of firms set up by unemployed and out of the labour force entrepreneurs revealed a selection bias. For the cohorts of firms started in 1994, 2002 and 2006, adjusting for this bias reveals that ACCRE had no effect on the survival of subsidised firms in any of the entrepreneur categories (i.e. short-term unemployed, long-term unemployed or out of the labour force). For the cohort of firms started in 1998, this effect was weak for short-term unemployed entrepreneurs (significant at the 10% threshold after four years, and the 20% threshold after five years), but significant (at the 1% threshold) when the sample was enlarged to include all eligible individuals.

This difference may be accounted for by regulatory changes. In 1998, draconian budget restrictions impacted all categories of recipients (Table 2). Conversely, during the second quarter of 1994, the number of recipients increased following changes to make the subsidy more generous. For 2002 and 2006, the eligibility conditions were loosened. One cannot rule out the possibility that these regulatory changes may have acted as signals, impacting not only the number but also the personal characteristics of unemployed and out of the labour force entrepreneurs. In 1998, the dissuasive nature of the signal may have restricted the candidate population to only the most competent and best equipped to start a firm. This would have exerted a self-selection effect among entrepreneurs, which may account for our results regarding the effect of ACCRE for this cohort. The instrumental variables in our model were designed first and foremost to reflect the economic changes, at department level, taken into account by officials in their ACCRE granting decisions. These variables may less faithfully reflect the behaviour of potential entrepreneurs, who are more sensitive to national changes such as restrictions in national funding allocations for the ACCRE programme or the general macroeconomic situation.

The more accommodating legislation introduced in the second quarter of 1994, and from the early 2000s, may have prompted new categories of people (in particular minimum social welfare recipients) to set up a firm. This more generous legislation led to a considerable increase in the number of recipients, but had no impact on five-year survival rates among subsidised firms. There may have been a reverse self-selection effect, prompting individuals who were less competent and less well-equipped to run a firm to try their luck. Moral hazard effects may also have played a role. Individuals thus encouraged to start a firm took less risk and invested less, inasmuch as they were very likely to receive the subsidy. Accordingly, they may in some cases have been less well-prepared and motivated to make their project a success. Once again, these selection or moral hazard effects may have been imperfectly controlled in our model. The programme's limited or even non-existent effect on firm survival should not overshadow any qualitative aspect. Broadening the ACCRE eligibility conditions may have provided an incentive to groups with slim chances of employment to start their own business, hence improving their employability. □

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Table A
Estimation of the *probit* model with the dependent variable: participation in the ACCRE programme (Yes/No) – short-term unemployed entrepreneurs

Cohort	1994	1998	2002	2006
Limited financial resources (*ref.* Ample resources)	- 0.44** [0.07]	- 0.18***[0.07]	- 0.16**[0.05]	- 0.26**[0.05]
French nationality (*ref.* Foreign)	0.47***[0.11]	0.26**[0.13]	0.28***[0.07]	0.19**[0.08]
Male gender (*ref.* Female)	- 0.01 [0.08]	- 0.11 [0.07]	- 0.12**[0.05]	- 0.09* [0.05]
Age group >50 (*ref*. 16 - 50)	- 0.03 [0.17]	- 0.33**[0.13]	- 0.02 [0.07]	- 0.10 [0.07]
Education. qualifications (*ref.* CAP/BEP vocational diplomas)				
No qualifications	- 0.11 [0.08]	- 0.30***[0.09]	- 0.28***[0.07]	- 0.30***[0.09]
BEPC secondary school certificate	included in BEP	- 0.10 [0.11]	- 0.02 [0.08]	- 0.22**[0.09]
Vocational baccalaureate (bac pro)	- 0.02 [0.08]	- 0.07 [0.10]	- 0.03 [0.07]	- 0.10 [0.09]
General baccalaureate	(Voc.+gen. bac)	- 0.02 [0.13]	0.06 [0.08]	- 0.15 [0.11]
Higher education	0.06 [0.10]	0.17** [0.09]	0.08 [0.06]	- 0.10 [0.07]
Previous job category (*ref.* Executive)				
Business owner	- 0.97***[0.23]	- 0.50* [0.33]	- 0.16 [0.17]	- 0.24 [0.26]
Tradesman or trader	- 0.91***[0.19]	- 0.51***[0.17]	with bus. owners	(all non-employees)
Supervisory worker	0.16 [0.14]	0.25 [0.16]	0.21*[0.12]	- 0.03 [0.08]
Intermediate profession	0.15 [0.14]	- 0.01 [0.13]	(all employees	- 0.06 [0.09]
Clerical worker	0.11 [0.10]	- 0.08 [0.10]	except executives)	- 0.16** [0.07]
Manual worker	- 0.06 [0.11]	- 0.04 [0.11]		- 0.18**[0.09]
Student	- 0.92***[0.18]	- 0.51***[0.14]	0.09 [0.17]	(inc. all
Other non-working	- 0.73***[0.17]	- 0.41***[0.15]	0.01 [0.12]	non-employees)
No employees (ref. One or more employees)	0.046 [0.072]	0.49***[0.08]	0.17***[0.05]	0.19**[0.06]
Other public subsidies: Received (ref. Did not receive)	d.m	0.62***[0.12]	0.38***[0.05]	0.28***[0.06]
Legal form: Companies and liberal prof. (*ref.* individual business)	- 0.36*** [0.08]	- 0.55***[0.08]	- 0.36***[0.05]	- 0.20***[0.06]
Firm created in Q2 (ref. Q1)	0.10* [0.06]	0.09* [0.05]	0.11***[0.04]	0.05 [0.05]
Departmental labour market tightness	- 0.62*** [0.23]	- 0.94***[0.20]	- 0.28*** [0.11]	- 0.30***[0.07]
Constant	1.04***[0.23]	- 0.21 [0.21]	- 0.03 [0.17]	0.297*[0.160]
Number of observations	4,230	3,355	5,588	7,300
Log likelihood	- 7,691	- 6,170	- 7,437	- 12,037
Pseudo R^2	0.116	0.135	0.087	0.077

Note: Observations weighted using the *SINE* survey's *poidsini* variable (Box 1). Coverage and control variables not shown in this table: see table 4 in the main text. For the 2006 cohort, the survival variable was calculated after three years, as the five-year data was unavailable.
Reading note: French citizens had a higher probability (significant at the 1% or 5% threshold, depending on the cohort of ACCRE recipients) than foreigners to participate in the ACCRE programme
Source: Insee, *SINE* surveys 1994, 1998, 2002 & 2006.