Do Innovation Policy Mixes Matter for Firm Performance?

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1 Introduction and Motivation

A central question in the economics of innovation is whether and how public subsidies raise private investment in research and development (R&D). A voluminous empirical literature has estimated the impact of individual instruments, such as tax credits, direct grants, and employment-linked exemptions, with favorable (often heterogeneous) firm outcomes [Hall and Van Reenen, 2000, Klette et al., 2000, Becker, 2015]. Yet this literature almost universally treats each instrument as a standalone binary treatment, evaluated in isolation from the broader policy environment in which firms operate [Bloom et al., 2019].

In practice, firms rarely encounter a single instrument. Modern innovation systems are characterized by policy mixes–overlapping portfolios of tax incentives, discretionary grants, and regulatory exemptions that firms may receive simultaneously or in sequence over their life cycles [Dumont, 2017]. Whether the order and timing of these instruments matters, and whether that order interacts with where a firm stands in its lifecycle, are questions the existing literature has largely left unanswered.

This paper addresses that gap using a uniquely rich administrative panel covering French innovative firms. France operates three major R&D support instruments with

sharply distinct eligibility logic: the *Crédit d'Impôt Recherche* (CIR), a broad-based R&D tax credit available to all firms regardless of size or age; the *Jeune Entreprise Innovante* (JEI) scheme, which provides social-security contribution exemptions on R&D wages exclusively to firms under eight years old that spend at least 15 percent of taxable expenses on R&D; and *Bpifrance* (BPI) innovation grants, which are awarded on a discretionary, project-by-project basis. In addition to these three programs, France also supports R&D under the *Pôle de compétitivité* (competitiveness cluster) policy that provides corporate tax, social security and property tax exemption for collaborative projects located in particular designated areas. Together, these instruments vary along every dimension that theory suggests should matter: the stage of the financing constraint they address, the mechanism through which they operate (cash-flow relief vs. tax liability reduction vs. certification), and the eligibility rules that govern access. This institutional variation is the motivation for much of this paper.

Our central question is: Does the sequence in which innovative firms use these instruments affect their long-run survival and performance, conditional on ever receiving public support? We further ask whether the answer varies across the firm lifecycle–in particular, whether the transition from JEI to CIR at the age-eight eligibility cliff constitutes a binding financial shock, and whether the timing of BPI receipt relative to this transition mediates long-run outcomes.

The contribution is threefold. First, we document, for the first time in the French context, the empirical distribution of subsidy tools among innovative firms: how many firms stack instruments simultaneously, how many accumulate them over time, and what the most common sequences are. Second, we descriptively characterize survival by pathway and then will use the sharp age-eight JEI cutoff as a source of quasi-experimental variation in the timing of instrument expiry. Third, we speak to an emerging literature on R&D policy mixes by providing evidence that the form of support matters as much as its level, and that it matters differently at different lifecycle stages.

2 Background: The French Policy Instruments

France's multi-instrument innovation support system provides the ideal institutional setting for this analysis. We briefly describe the four main instruments and the eligibility rules that differentiate their populations.

Crédit d'Impôt Recherche (CIR). Introduced in 1983 and substantially reformed in 2008, the CIR is a tax credit equal to 30 percent of eligible R&D expenditures up

to €100 million (and 5 percent beyond). Crucially, it imposes no firm-size, firm-age, or ownership restriction: any industrial, commercial, or agricultural firm subject to corporate or personal income tax is eligible, provided its activities meet the standard Frascati criteria for fundamental research, applied research, or experimental development. The CIR is the primary R&D fiscal instrument in France, with annual costs exceeding €7 billion and over 20,000 claimants. SMEs that are loss-making may claim immediate reimbursement of the credit rather than carrying it forward.

Jeune Entreprise Innovante (JEI). Created in 2004, the JEI scheme targets young innovative SMEs during the pre-commercial phase of their development. To qualify, a firm must simultaneously: (i) qualify as an SME under EU definitions (fewer than 250 employees, turnover below €50 million); (ii) be under eight years old; (iii) be at least 50 percent owned by individuals or recognized public-interest entities; and (iv) incur R&D expenditures representing at least 15 percent of total tax-deductible costs. Qualifying firms receive exemptions from employers' social-security contributions on the wages of R&D personnel, as well as partial corporate income tax exemptions in the first two profitable years. The age-eight cutoff is absolute: firms lose JEI status definitively the year they turn eight, regardless of their R&D intensity or financial condition. This rule generates the identification strategy described in Section 4.

Bpifrance Innovation Grants (BPI). Bpifrance is France's public investment bank, and its innovation grants fund R&D and innovation projects at various stages of development. Unlike the CIR and JEI—which are rule-based entitlements claimed through the tax filing system—BPI awards are discretionary, competitive, and project-specific. Eligibility is formally limited to SMEs and mid-sized companies (fewer than 2,000 employees), but receipt requires a successful application evaluated by Bpifrance on the merits of the proposed project. BPI awards thus carry a dual function: they provide cash-flow support and simultaneously certify project quality to private investors. The amounts vary widely, from small feasibility grants (€50,000) to substantial development advances (up to €3 million).

Competitiveness Clusters (Pôles de compétitivité.) Created in 2005, the competitiveness cluster policy aims to stimulate innovation by organizing geographically concentrated networks of firms, research institutions, higher education institutions, and public organizations around specific technological or sectoral priorities. Unlike the CIR and JEI—which operate primarily through the tax system—the cluster policy supports eligible projects that are R&D collaborations involving multiple firms and at least one

research partner, such as a public or private laboratory, university, or technology-transfer organization. The policy initially combined fiscal exemptions with direct project funding. Firms participating in qualifying R&D projects and located in designated R&D zones could benefit from corporate income tax exemptions (for the first 3 profitable years), partial employer social-security contribution exemptions (up to 50% for SMEs), and local tax exemptions (e.g. property tax exemption for 5 years), although several of these generous fiscal advantages were phased out by the mid-2010s.

Table 1: French R&D Support Instruments: Key Eligibility Dimensions

	JEI	**CIR**	**BPI**	**Competitiveness clusters**
Instrument type	CIT & Payroll exemption	Tax credit	Grant/advance	CIT & Payroll exemption
Firm size	SME only	No restriction	SME / Mid-size	No restriction
Firm age	≤ 8 years (hard)	No restriction	No restriction	No restriction
R&D intensity	$\geq 15\%$ of expenses	No threshold	No threshold	No threshold
Independence	$\geq 50\%$ private	No restriction	No restriction	No restriction
Selection mechanism	Rule-based	Rule-based	Discretionary	Discretionary
Value to loss-making firms	Immediate (payroll, tax)	Deferred / refundable	Immediate (cash)	Immediate (payroll, tax)

Table 1 summarizes the key eligibility dimensions. The final row of Table 1 highlights key important differences in those policies for young firms. A young SME with a large wage bill but no profits derives immediate cash-flow relief from the JEI or competitiveness cluster payroll exemption, is eligible to receive a cash refund from CIR or direct cash transfer from a BPI grant. A young non-SME firm is not eligible for JEI and receives little from a CIR credit that must be carried forward until taxable income is generated. As firms age into profitability, the CIR becomes progressively more valuable. The prediction is therefore that the optimal instrument mix shifts over the lifecycle—and that the JEI-to-CIR transition at age eight is a particularly consequential moment.

3 Related Literature

3.1 Effects of Individual R&D Instruments

The foundational review by Hall and Van Reenen [2000] established the benchmark finding that a dollar in tax credit stimulates approximately a dollar of additional R&D, though the evidence from individual country studies is heterogeneous. Klette et al. [2000] provide the canonical treatment of identification challenges in this literature, emphasizing that neither recipients nor non-recipients constitute random samples and that spillover effects complicate the construction of valid counterfactuals.

More recent work on the impact of R&D subsidies on various outcomes has moved

toward quasi-experimental designs [Bloom et al., 2002, Akcigit et al., 2018, Lokshin and Mohnen, 2013, Rao, 2016, Agrawal et al., 2020, Einiö, 2014, Güçeri and Liu, 2019, Dechezleprêtre et al., 2023, Appelt et al., 2025]. For example, Howell [2017] exploits a regression discontinuity in ranked applicants to the US Department of Energy's SBIR grant programme, finding that an early-stage award approximately doubles a firm's probability of subsequently receiving venture capital—an effect driven by financing constraint relief rather than certification. This result is particularly relevant to our setting, where BPI grants play a structurally similar role. Hottenrott and Richstein [2020] compare the effects of grant-based versus loan-based start-up subsidies in Germany, finding that instrument form matters: grants generate larger effects on innovation output than equivalently sized loans, consistent with the view that cash-flow relief is more valuable than credit extension for pre-revenue firms.

Becker [2015] offers the most comprehensive review of the literature through 2015, surveying evidence on R&D tax credits, direct subsidies, and support for human capital formation. The review concludes that both tax credits and direct subsidies generally stimulate private R&D, but highlights the near-universal absence of evidence on how instruments interact when they coexist—the central question of our paper. Rao and Simcoe [2026] provide the most recent overview of the literature focusing on the US.

3.2 Policy Mixes and Instrument Interactions

A smaller but growing literature has begun to examine the joint effects of multiple instruments. Dumont [2017] develops a framework for assessing the policy mix of public support to business R&D, distinguishing complementarity (where instruments reinforce each other's effects) from redundancy (where they crowd each other out). The empirical evidence on which relationship dominates is mixed. Studies focusing on simultaneous receipt of grants and tax credits tend to find complementarity [Neicu, 2019], while others find no interaction or even substitution [Petrin and Radicic, 2023].

Critically for our purposes, almost all existing studies conceptualize the policy mix as a static bundle [Montmartin et al., 2018, Marino et al., 2016, Pless, 2026]. The dynamic, sequential dimension has received almost no empirical attention. Lenihan et al. [2025] is the closest precedent, finding for Irish firms that the order in which grants and tax credits arrive matters for how much R&D firms undertake. Three features of our setting go beyond their analysis. First, our instruments are structurally heterogeneous where each addresses a distinct financing constraint at a different lifecycle stage. This makes se-

quencing theoretically richer than in their two-instrument, same-objective design. Second, we exploit a hard age-based eligibility cliff that generates quasi-experimental variation in instrument expiry, rather than relying solely on matching. Third, we study firm survival and performance rather than R&D spending alone.

3.3 Financing Constraints and the Firm Lifecycle

A substantial literature documents that financing constraints are particularly severe for young, innovative firms [Hall, 2010]. These constraints operate through information asymmetries whereby investors cannot observe R&D project quality, which makes R&D investments difficult to collateralize. The implication is that the wedge between private and social returns to R&D is largest for young firms, providing the strongest justification for age-targeted instruments like the JEI.

The literature also suggests that the nature of the constraint changes with firm age. Pre-revenue firms face acute cash-flow constraints in that they need money to pay researchers today regardless of future returns. As firms begin generating revenue, the binding constraint shifts toward credit access and the cost of external finance. Late-stage firms may face relatively mild financing constraints on R&D but still benefit from tax credits through their user-cost effects. This lifecycle gradient in constraint type maps directly onto the instrument gradient described in Section 2: payroll exemptions (JEI) address cash-flow constraints; tax credits (CIR) reduce the user cost; discretionary grants (BPI) provide both cash and certification. If instrument design tracks the lifecycle of the constraint then the optimal policy might be more of a ladder.

4 Data

Our analysis draws on a linked administrative panel constructed from French fiscal records. The database integrates firm-level annual financial and tax returns data from the BIC (Bénéfices Industriels et Commerciaux) tax files with administrative records on JEI status, CIR claims (GECIR), BPI awards, Cluster competitiveness grants, and linked survey data from the Community Innovation Survey (CIS) and the R&D employment survey (RDS). Our data covers the period 2008 –2023.

In Figure 1, for firms receiving any innovation support throughout the sample period, we plot their total amount of R&D spending and divide that into amounts they declare to be privately funded, self-funded, and publicly funded. Total R&D spending among

supported firms increased substantially over the period, rising from just over €20 billion in 2008 to more than €35 billion by the early 2020s. Further, the survey based information suggests that the vast majority of firms' R&D expenditure came from internal resources, with self-funding consistently accounting for the largest share of total R&D budgets throughout 2008–2023. As the survey does not include information on CIR or JEI policies usage, the publicly funded amounts understate the true extent of government support. That is because firms recover around 30% of their self-funded R&D through the tax credit alone. This suggests that public support programs and private finance play an important complementary role, but that sustained R&D investment ultimately depends primarily on firms' capacity to mobilize their own resources. Importantly, this figure is masking heterogeneity in usage of the various means of funding across firm characteristics.

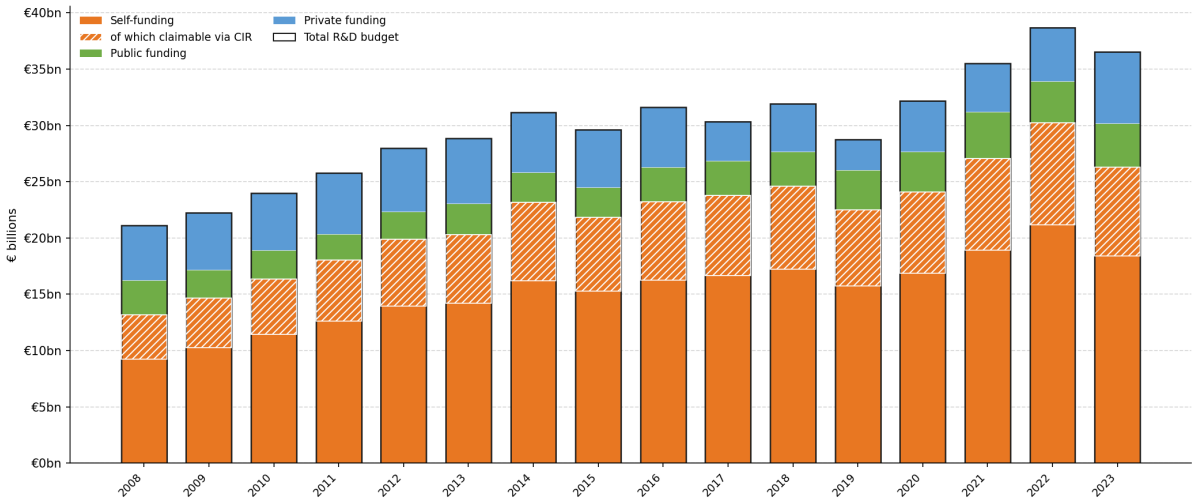


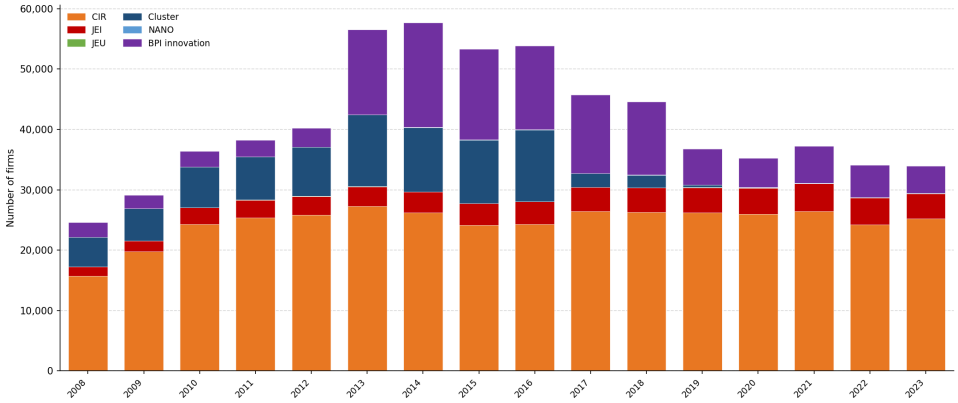
Figure 1: R&D funding sources among firms receiving support

Figure 2 shows a gradual increase in the number of firms receiving R&D support between 2008 and the mid-2010s, followed by a gradual decline. In addition to expanding CIR, firms usage of the BPI and cluster support schemes has expanded. Panel B of Figure 2 shows the total amount of support received by firms divided by type of support. CIR by far dominates, with consistently around €7-9 billion of annual support each year. BPI is the second most important source of R&D funding for firms and has increased in its importance since mid-2010s. Other programs offer relatively little financing support in aggregate, but may be very important for smaller firms that have much smaller R&D budgets.

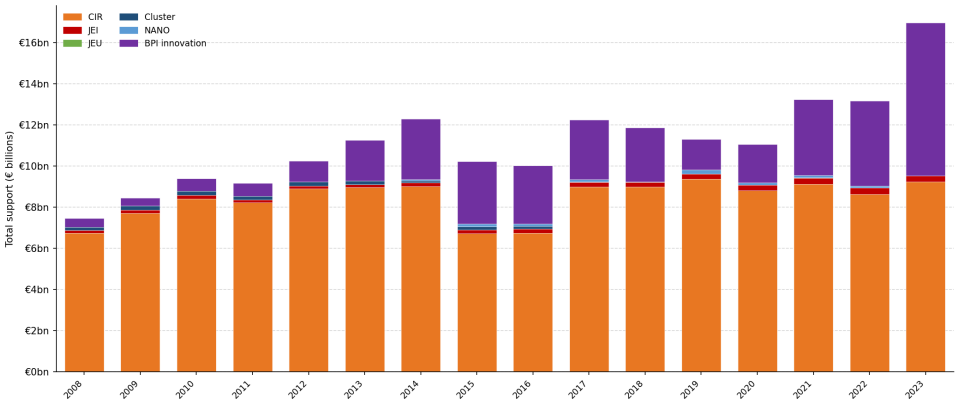
To uncover the role of sequencing of the public financing support schemes, we restrict the sample to JEI-eligible firms defined as firms that ever perform R&D and hold SME or micro-firm status at the beginning of their life-cycle. Since we have information on JEI

Figure 2: Public R&D funding sources among firms receiving support

Panel A: Number of firms.



Panel B: Funding amounts.



Note: In Panel A, we plot the number of firms that receive each support type in each year. A firm that receives multiple sources of support appears in the dataset for each type of support it receives. In Panel B, we plot the total amount of support received by type of support.

recipients going back to 2004, we organize our firm-level data into cohort panel starting in 2004. Cohorts are defined by founding year and each firm is tracked from founding until exit or the end of the observation window. We stop the analysis in 2019 to avoid picking up the effects of the Covid pandemic. In this analysis we focus on key variables that include exit indicator (firm leaves the panel) employment, total revenue, wage bill, profits, R&D employment, and patents filed. A subset of cohorts also has CIS-linked innovation output measures (product, process, and service innovation indicators) and balance-sheet debt.

5 Descriptive evidence

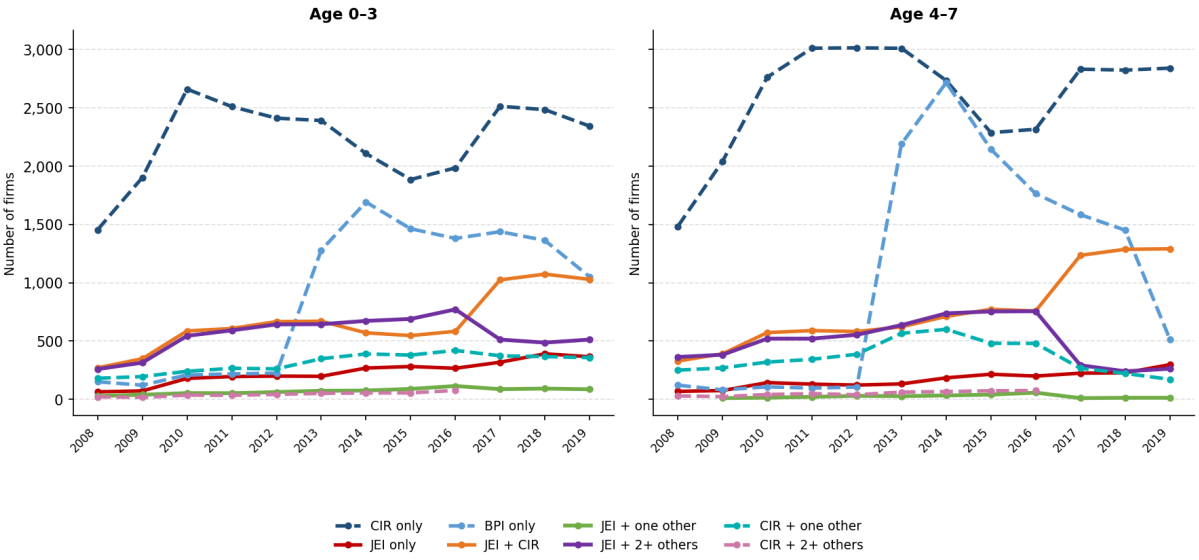
We start by showing how JEI-eligible firms utilize available sources of public funding. In Panel A of Figure 3 we plot the number of firms below the age 8 that use each support scheme in each year we observe them in the sample. Two observations emerge. First, most young firms use just one single support scheme, either just CIR or just BPI, followed by JEI and CIR combination. However, on average, firms that use just one scheme receive much less support than firms that use 2 or more (see Panel B). In fact, firms that receive the most support on average appear to be firms that benefit from JEI and at least 2 other schemes (most commonly CIR and BPI or CIR and Cluster) or CIR and 2+ other support schemes. This pattern also persists across asset size bins for JEI qualifying firms. This descriptive evidence suggests that firms that stack the R&D support they receive, benefit more than those that use just a single scheme. This stacking pattern is persistent across all years in the sample.

We then characterize how the usage of these different support schemes affects the performance of firms that use them. For that purpose, we use cohort data and define year zero as the year in which the firm is born. We track the performance of firms that were born JEI eligible (they were SMEs below certain size at birth) from the year they were born until 2019. In Table 2, we show average survival, revenue, employment, wage bill, taxable profits, number of patents, and R&D employment count for all cohorts in our sample. We find that firms that are born JEI eligible and use CIR and cluster support policies (either by itself, or combined with BPI) but not JEI have by far the best performance and the highest survival rate in 2019 among all different groups of firms benefiting from different support schemes. Firms that only use JEI scheme and no other R&D support perform poorly, relative to even firms that receive no public R&D support. While stacking different support systems clearly yields benefits to firms that do that, this preliminary descriptive evidence suggests that the largest benefits appear to be related to stacking that involves CIR and Cluster support schemes.

In Figure 4 we further plot the 10 year survival rates and performance for cohorts of firms born in years 2004 - 2009 across different combinations of public R&D support that these firms receive over the 10 years we observe them. These plots confirm evidence from Table 2 that firms that use only JEI support perform poorly relative to firms that benefit from combinations of support. For example, firms that benefit from CIR only have large revenues of around €10 million on average by year 10 and over €1.7 million wage bill, over 70% of them survive until 10 years, and they are profitable by year 9 on average. In

Figure 3: Most commonly used public support combinations for SMEs.

Panel A: Number of firms using each combination of scheme.



Panel B: Average benefit to firms (€000s).

Support combination	Age 0–3	Age 4–7	Assets $\leq$ 0.5m	Assets 0.5m– 1m	Assets 1m– 2.5m
CIR only	284	264	75	109	258
JEI only	133	79	71	166	304
BPI only	369	200	89	81	203
JEI + CIR	418	488	172	357	606
JEI + one other	302	216	164	244	453
JEI + 2+ others	597	741	264	474	738
CIR + one other	419	492	127	229	285
CIR + 2+ others	547	858	113	244	466

Notes: In Panel A, we plot the number of firms benefiting from each scheme combination type across years for firms that are 0-3 years old and then for firms that are 4-7 years old. In Panel B, we tabulate the amount of support firms receive from each combination of schemes across years. The numbers are average support per firm in thousands of euros. ROws are count-weighted within each year before averaging across all years.

turn, for firms that receive only JEI, fewer than 10% of them survive past age 9, their revenues on average are at most €2 million by the time they are 4 years old and their wage bill is largest by the time they are 8. On average, they are still unprofitable even 8 years afer they are born.

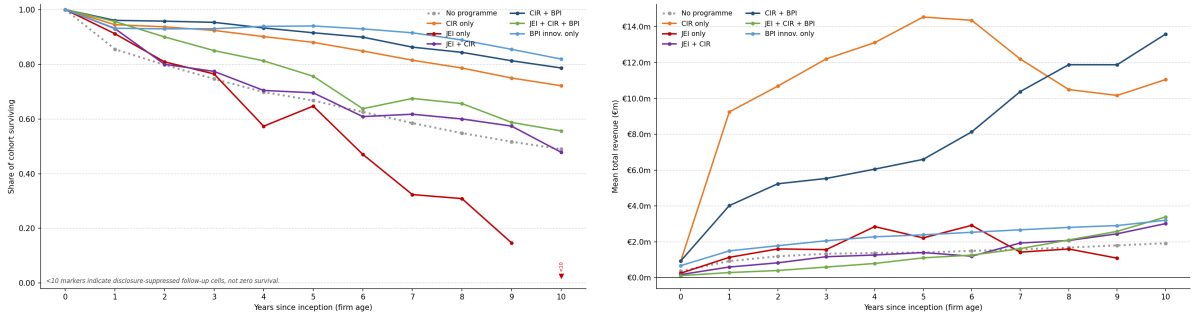
Table 2: 2019 outcomes by support combination across firm cohorts born between 2004 - 2018.

Support scheme	Survival	Revenue	Empl	Wage	Profits	Patents count	R&D empl count
No programme	0.67	0.52	44.0	66	17	0.17	7.5
JEI only	0.57*	0.25	3.0	47	9	0.14	2.7
CIR only	0.76	12.69	120.3	1702	-24	0.63	10.2
BPI innov. only	0.75	2.74	42.3	944	-57	0.29	1.8
Cluster only	0.70	4.38	14.8	471	107	0.00	1.0
JEI + CIR	0.72*	0.87	10.2	342	-64	0.12	4.7
JEI + BPI	0.49*	0.08	3.1	47	-70	0.28	1.0
CIR + BPI	0.78	9.72	50.6	1878	-179	5.51	28.0
CIR + Cluster	0.79	42.54	125.5	4698	3139	3.13	20.9
BPI + Cluster	0.38*	2.91	22.4	799	78	0.00	25.5
JEI + CIR + BPI	0.77*	1.19	12.9	559	-456	0.39	6.2
JEI + CIR + Cluster	0.37*	0.82	12.0	441	-161	0.00	3.7
BPI + CIR + Cluster	0.80	37.51	208.8	9590	-326	1.78	44.8
JEI + CIR + Cluster + BPI	0.74	2.13	19.7	987	-1309	1.06	14.9

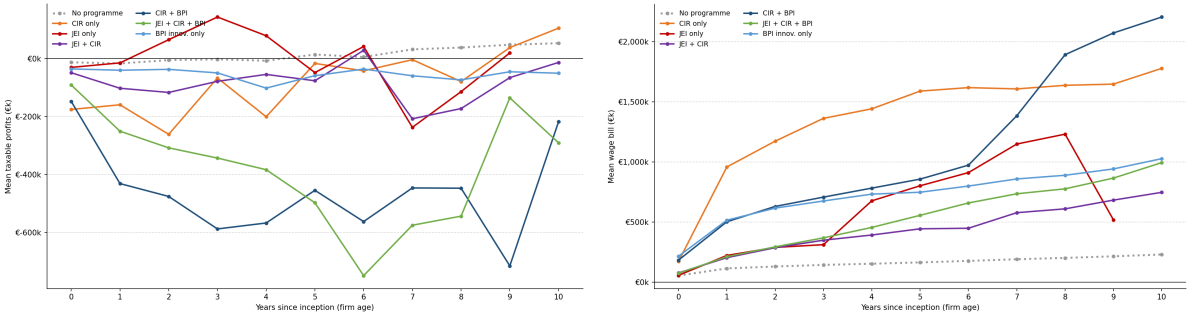
Notes: This table shows the mean outcomes in 2019 for firms born between 2004 - 2018. Each row shows the average of the outcome that is count-weighted across all available cohorts. Survival is the share of firms from cohorts born before 2019 that are still observed in 2019. Revenue is in millions of euros; wage (total wage bill) and profits (taxable profits) are in thousands of euros. Asterisks indicate survival values computed with at least one suppressed cohort-year cell omitted from the numerator due to disclosure rules allowing only 10 observations per cell.

Figure 4: Evolution of outcomes over 10 years since founding for JEI eligible firms.

Panel A: Survival; Revenues.



Panel B: Profits; wage bill.



Note: In Panel A, we plot the evolution of average survival rates and revenues for firms born in cohorts 2004 - 2009 stacked in year 0 which is their birth year. In Panel B, we plot the evolution of profits and firm wage bill. The sample includes firms that are JEI eligible when they are born.

6 Planned Empirical Strategy

While the descriptive analysis provides many interesting facts on the importance of using multiple public innovation support schemes, over the next few months, we will focus on analyzing firm-level in more detail following the blueprint outlined below.

6.1 Pathway Classification

We will start our firm-level empirical analysis by characterizing the population of supported firms by their support pathway. For each firm i, we define:

- t_i^k: the first year firm i receives instrument $k \in \{\text{JEI}, \text{CIR}, \text{BPI}\}$
- a_i^k: firm age at first receipt of instrument k
- $\Delta_i^{CIR-JEI} = t_i^{CIR} - t_i^{JEI}$: the gap in years between first JEI and first CIR receipt among firms that receive both

We assign each firm that ever receives any instrument to one of six mutually exclusive pathway types:

1. JEI-only: receives JEI, never transitions to CIR or BPI before exit
2. CIR-only: receives CIR, never receives JEI (too old, too large, or below the 15% threshold at founding)
3. Simultaneous stack:receives JEI and CIR in the same year or within one year
4. JEI $\rightarrow$ CIR:receives JEI first, then adds CIR at least two years later
5. JEI $\rightarrow$ CIR $\rightarrow$ BPI: the full ladder, with BPI arriving after both JEI and CIR
6. JEI $\rightarrow$ exit: receives JEI, never transitions to CIR, exits at or around age eight

The distribution of firms across these pathways will be the first headline result of the paper. If simultaneous stacking dominates, the system is better described as a bundle than a ladder and the policy implication is to simplify. If sequential accumulation is common, particularly the JEI $\rightarrow$ CIR transition, it suggests there is a firm lifecycle structure to exploit.

6.2 Survival and Growth by Pathway

Our first set of empirical estimates will compare survival and growth outcomes across pathway types. For each pathway group g and cohort c, we estimate:

$$Y_{ict} = \alpha_g + \beta_g \cdot \text{Pathway}_g + \mathbf{X}'_{ic0}\gamma + \delta_c + \varepsilon_{ict} \tag{1}$$

where Y_{ict} is an outcome (survival indicator, log revenue, log employment) for firm i in cohort c at observation year t; Pathway_g is an indicator for pathway type g; $\mathbf{X}_{ic0}$ includes founding-year characteristics (asset quartile, sector, initial employment); and δ_c is a cohort fixed effect. Standard errors are clustered at the firm level.

Because pathway assignment is endogenous wherefirms with better unobserved quality may be more likely to transition to CIR or attract BPI funding,we complement the OLS estimates with propensity-score matching within founding cohort and sector, using founding-year characteristics to construct the score. The goal is not causal identification but rather to partial out observable selection and produce pathway comparisons that are informative about system design.

6.3 The Age-Eight Cliff: A Regression Discontinuity

Our cleanest quasi-experimental variation comes from the JEI age-eight eligibility cutoff. Firms lose JEI status definitively the year they turn eight, regardless of performance or R&D intensity. This creates a sharp discontinuity in JEI exposure that is not manipulable (firm age at founding cannot be adjusted in anticipation of the threshold) and is exogenous to firm performance conditional on reaching age eight.

We estimate the following regression discontinuity specification on the sample of firms that were active JEI recipients at age seven:

$$Y_{i,a} = \alpha + \tau \cdot \mathbf{1}[a \geq 8] + f(a - 8) + \mathbf{X}'_{i0}\gamma + \varepsilon_{ia} \tag{2}$$

where a is firm age in years, $Y_{i,a}$ is a post-cliff outcome (in this paper we focus on firm survival), $f(\cdot)$ is a flexible polynomial in centered firm age estimated separately on either side of the cutoff, and $\mathbf{X}_{i0}$ is a vector of founding-year controls. The parameter τ identifies the effect of losing JEI eligibility at age eight, for firms just below the cutoff.

Crucially, we interact this specification with an indicator for whether the firm had already established a CIR claim by age seven. The hypothesis is that firms with CIR already in place at the cliff face a smaller discrete change in their effective subsidy and

this buffers the age-eight shock. This interaction is the key test of whether the JEI-to-CIR transition constitutes a managed lifecycle graduation or an abrupt cliff.

6.4 BPI Timing

Among firms that ever receive a BPI award, we examine how the age at first receipt predicts long-run survival and growth. We classify firms by BPI timing:

- **BPI-early:** first BPI award at age ≤ 3
- **BPI-mid:** first BPI award at age 4–7 (within JEI window)
- **BPI-late:** first BPI award at age ≥ 8 (after JEI eligibility expires)

We then estimate survival and growth differences across these groups conditional on founding characteristics, testing whether BPI early in the lifecycle functions as a catalyst (enabling survival to the stage where CIR becomes valuable) or whether it functions as a reward for demonstrated viability (with the survival advantage reflecting selection rather than treatment).

7 Expected Results and Contributions

We anticipate three sets of results, each with distinct policy implications. First, regarding the sequencing distribution, we expect that simultaneous stacking of JEI and CIR in the same year is less common than the literature implicitly assumes. Given that JEI requires loss-making firms to absorb payroll costs, making the CIR carry-forward less immediately useful, and that the JEI independence requirement limits participation in some large R&D consortia that attract CIR attention, the instruments may naturally sort firms into different groups. A high share of the JEI→CIR pathway would validate the ladder hypothesis and support the current sequential design of the French system.

Second, concerning the age-eight cliff, we expect differential post-cliff survival between firms that had CIR in place at age seven and those that did not. If the cliff is genuinely fatal for the latter group, this would provide direct policy evidence that the JEI-to-CIR transition should be actively managed. For example, policymakers could require JEI firms to establish a CIR claim before eligibility expires or extend the JEI window for firms that have not yet turned profitable.

Third, with respect to BPI timing, we expect BPI firms that receive BPI during the JEI window to show the best long-run outcomes. BPI-early firms may be too immature to

convert project grants into sustainable growth, whereas BPI-late firms may be receiving the grant as a reward for survival rather than as a catalyst for it. Such a finding would support the view that the optimal sequencing is JEI (payroll relief) → BPI (project validation during early development) → CIR (user-cost reduction at maturity).

The paper makes three contributions to the literature. First, it provides the first large-scale empirical analysis of R&D subsidy sequencing in the French context, extending the framework of Lenihan et al. [2025] to survival outcomes. Second, it exploits an age-based eligibility cliff to produce quasi-experimental evidence on the consequences of instrument expiry, a design not previously used in this literature. Third, it characterizes how the optimal instrument mix varies over the firm lifecycle, connecting the innovation policy literature to the broader literature on financing constraints and lifecycle investment.

8 Limitations and Caveats

Several important limitations should be noted. First, all pathway-level comparisons are descriptive: selection into pathways is endogenous and we cannot rule out that unobserved firm quality drives both pathway assignment and long-run outcomes. The regression discontinuity at age eight is the only source of clean quasi-experimental variation, and its external validity is limited to firms near the JEI age cutoff. Second, the BPI timing analysis faces the additional challenge that BPI award dates may be partially driven by project readiness, which is itself correlated with firm performance. We address this through matching and by conditioning on founding-year characteristics, but residual confounding remains. Third, our sample is restricted to JEI-eligible firms (ever R&D, SME or micro-firm status), which limits external validity to this population.

Despite these limitations, the descriptive pathway analysis and the regression discontinuity design together constitute a significant advance over the existing literature, which relies almost entirely on cross-sectional comparisons of firms that ever receive support against those that do not.

9 Conclusion

This paper proposes to study how the sequence and timing of R&D subsidies shapes long-run firm survival and growth among French innovative SMEs. By exploiting the distinct eligibility rules of the JEI, CIR, and BPI instruments, and the sharp age-eight JEI cutoff, we aim to provide the first systematic evidence on whether order matters in the lifecycle

of public support and which ordering works best. The answer has direct implications for the design of innovation support systems in France and, by analogy, across the OECD.

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