Tax Subsidies, Employer Incentives, and the Take-up of Retirement Plan Matching Contributions: Evidence from France

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Abstract

Employer matching contributions to retirement saving plans are widely viewed as one of the important incentives for worker participation. The availability of these contributions also raises a puzzle: why do substantial numbers of workers choose not to contribute to retirement plans, even in the presence of generous matches? This paper analyzes administrative data from the largest retirement plan provider in France (Amundi) to study both the determinants of employer matching contributions and the worker characteristics that are associated with passing up these contributions. The institutional structure of the private retirement saving system in France makes it an attractive setting in which to study the determinants of and consequences of employer matching. French firms have more discretion in setting match rates than their U.S. counterparts. They may choose match rates that differ across investment choices, providing higher match rates on company stock, for example, than on other investment options. They may also offer piecewise linear match rate schedules with declining match rates as the amount contributed rises. At many firms, workers are confronted with complex match schedules.

This paper makes several contributions to the analysis of workplace saving in the presence of employer matching. First, it describes the institutional setting for saving in defined contribution pension plans in France, and explains the constraints on match rates that firms may offer and on the total contributions that workers may make to these plans. It draws on data from more than 22,000 French firms to summarize the match rate choices of these firms, and on retirement plan contributions by nearly 1.2 million workers to summarize contribution behavior as a function of match rates.

Second, it describes how the potential tax benefits to workers of using generous match rates to shelter earnings from taxation must be balanced against the potential cost of generous contributions to firm owners. When firms are stratified by the number of employees, the match rates at very small firms are much higher than those at larger firms, suggesting that the optimal

choice of match rate is sensitive to the agency issues between owners and workers. The mean first-euro match rate at small firms is 272%, compared to 115% at large firms.

Third, the paper summarizes the cross-sectional determinants of "money left on the table," non-participation by employees who are offered generous matches. Workers whose employers offer more complex plans are less likely to take up matches, as are workers who appear to be liquidity constrained based on other decisions, such as choosing to cash out their variable compensation rather than direct it to a saving plan. These findings suggest that at least some of the workers foregoing the match may view current liquidity as more valuable than the match and associated deferral of access to current compensation.

Finally, we study the effects of a workplace education campaign by the retirement plan administrator that contacted workers who were not taking advantage of matching contributions and explained the benefits of doing so. We examine the increase in take-up as a result of this initiative, as well as the differential increase in take-up across participants in more and less complex plans, and plans with higher and lower marginal match rates. The nature of the informational outreach is similar across plans, so the variation in plan attributes is the source of identifying variation.

Overall, the results provide new information on the factors that influence firm's choice of retirement plan match rates – a relatively under-studied topic – and they also contribute to the more heavily studied question of how match rates and other retirement plan characteristics affect employee saving decisions.

Briere/Poterba/Szafarz: Supplemental Material

This study brings new data, and new sources of variation, to bear on the analysis of retirement saving behavior. We analyze the behavior of more than one million French employees working at over 8,000 companies that are served by Amundi, the largest pension plan administrator in France. We rely on administrative data that includes plan characteristics and that makes it possible to study the association between firm attributes, worker characteristics, and retirement plan attributes. The paper investigates three questions: (i) how do firm attributes, in particular the size of the firm, affect the generosity of the plan and the extent to which it captures potential tax benefits for employees?; (ii) how do plan attributes affect employee take-up of retirement benefits?; and (iii) how do educational interventions that call attention to foregone tax benefits affect employee participation?

While the U.S. has been the setting for the preponderance of research on defined contribution plan participant behavior, in many ways the French case is a more interesting setting to study because employers are permitted to design more complex matching structures than in the U.S. Defined contribution (DC) plans exhibit a wide variety of matching features. Moreover, there are substantial tax benefits from delivering income to workers in the form of pension contributions.

To preview our key findings, first, we discover that the number of employees at a firm is strongly correlated with both the generosity of the plan's matching provisions and with the rate of employee take-up. There are several potential explanations of this finding. First, there is a notch in the tax treatment of retirement plan contributions for workers that generates larger incentives for generous employee matching at small than at large (50+ employee) firms. Second, at very small firms, very high match rates offer owner-managers a way to shift their compensation toward a tax-deferred category, thereby raising after-tax compensation. Some firms offer matching rates of 300%, the statutory maximum. Third, larger firms must consult union delegations when designing their matching plan; this may constrain management options or better reflect worker preferences. Total plan cost, rather than plan design, appears to be a more central concern at large than at small firms.

Second, employees appear to respond to variation in plan characteristics, such as complexity and the menu of investable asset classes. In addition, reminders to employees who are not participating in plans with generous match rates can raise participation, in some cases substantially. Plan complexity has a particularly negative effect on the average take-up rate at the firm. Individual attributes also have important predictive power for take-up.

1. Defined-Contribution Plans in France

French defined-contribution (DC) plans are designed to encourage employees' medium-to-long term savings with employer sponsorship. Firms with more than 50 employees are required to provide DC plans. The legal environment governing DC plans is complicated, consisting of a two-part tax-incentivization system that involves PEE (for "plan d'épargne d'entreprise") and PERCO (for "plan d'épargne retraite collective") plans.[1] In 2015, 55% of the French employees participated to PEE and/or PERCO savings plans.

PEE plans are the most common employee savings plan[2] in France for medium- to long-term savings. These plans are typically the default option for variable remuneration, which is a standard feature of most French compensation packages. Unless an employee opts out, his or her annual bonus will automatically be credited to a PEE account in the bank chosen by their employer. Withdrawals are forbidden during a five-year period, although there are exceptions for events such as marriage, birth of a child, purchase of a home, and some other life events. PERCO works similarly, but targets longer-term retirement savings. Investment in company stock is allowed in PEE but not in PERCO.

Beyond investing their variable remuneration in a PEE or PERCO, and thereby deferring taxes on this income, employees can also make after-tax voluntary contributions to their employer-sponsored savings plan. They may contribute up to 25% of their earnings. These contributions may be eligible for employer matching contributions; 73% of firms in our sample provide such contributions.

[1] In fact, there are two additional structures, namely PEG ("plan d'épargne groupe") and PEI ("plan d'épargne interentreprises") specifically used for very large groups. Their prevalence is however negligible with respect to PEE and PERCO. Hence, this analysis will disregard them.
[2] French Ministry of Labor: http://dares.travail-emploi.gouv.fr/IMG/pdf/2017-055.pdf.

When the employer designs a defined contribution pension plan, it makes two key choices. First, it selects a collection of investment funds among which employees can choose to allocate their contributions, along with a default investment fund. Second, it defines match rates for each investment option. *These match rates can vary across options, an important difference from U.S. pension plans.* The default option may or may not be matched. The matching rate can be as high as 300%. Offering matching contributions has pluses and minuses for the firm. The former include tax-deductibility of these contributions, and the possibility for listed companies to encourage employees to buy company stock, thereby dispersing ownership and reducing takeover threats.[3] In small firms, high match rates can allow owner-managers to provide additional compensation to the employees with the financial capacity to take advantage of the matching provisions. The limit on the amount of retirement plan contributions that can be exempt from taxation is limited, per employee per year. The limits vary by investment choice. In 2017, for example, the overall ceiling was EUR 9,414 for matching plans that exclude company stocks, and EUR 11,924 for those that include them.

Matching contributions must be offered uniformly to all employees or in a graduated fashion that is proportional to seniority in the firm. The matching rate may not depend on wages, which makes it difficult to restrict the advantage of matching to a limited group of beneficiaries. Managers may, however, choose to provide relatively limited information about matching provisions to their employees, and they may choose complex plan structures that may make it difficult for employees to evaluate their options.

1.1 Matching Contributions

This section formalizes the constraints on both employees and firms with respect to the design and contribution to a PEE or PERCO. Consider employee *i* working with firm *k* and receiving a total variable remuneration V_{ik}. The employee has three non-mutually exclusive options for this amount: 1) paying taxes on all or part of V_{ik} by opting out of the retirement plan; 2) investing all or part of V_{ik} in *non-matched funds* in firm *k*'s DC plan; and 3) investing all or

[3] Since 1994, when worker shareholdings fall above 5% (3% since 2002), the company must periodically propose to the extraordinary general meeting to designate a board member representing worker shareholdings.

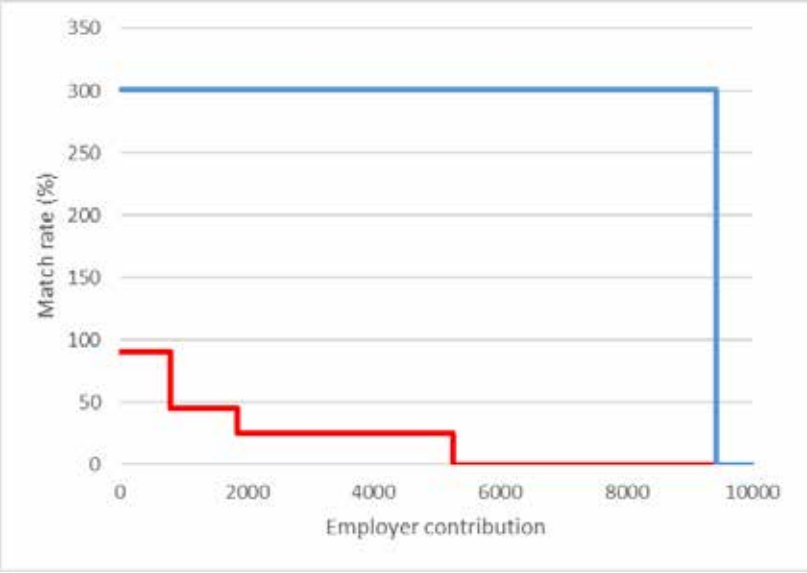
part of V_{ik} in *matched funds* in the DC plan offered by firm *k*, if there are any such funds. The investment options available to employees in each category are grouped into three categories:

- Medium-term company stocks (MTCS) – PEE plans
- Medium-term other assets (MTOA) – PEE plans
- Long-term other assets (MTOA) – PERCO plans

Company stock is not allowed in PERCO plans. There is substantial variation across firms in the type of both medium- and long-term investment choices available to workers. Some firms suggest only low-risk and well diversified funds, while others offer riskier options. Firms in our sample offer between 1 and 50 investment funds.

Employers select a default fund (DF) and also set the matching rates on different investment options. The matching function can be piecewise linear: it must be a non-increasing step function with no more than six steps. Each matching formula therefore entails up to 20 parameters as follows: $(r_j, c_j), j = 1, \dots, J$, where $J \leq 6$ and the matching rate is equal to r_j for $c_j < m \leq c_{j+1}$, where m is the employee's contribution devoted to the fund. Matching rates are not larger than 300% $(r_j \leq 300\%)$. Figure 1 shows two examples of matching formulae: a constant rate version and a variable-rate formula with a falling match rate as the contribution rises.

Figure 1: Examples of matching formulas



Since firms can choose different matching formulas for different investment options, a firm interested in encouraging employees to hold company stock might offer a higher match rate for MTCS while still providing some matching of other investments in LTOA (long-term savings). While the French system can lead to highly complex rules, in practice firms often chose simple formulas, such as flat matches, holding uniformly across funds.

In addition to defining investment-specific matching formulas, a firm may cap the amounts it grants for each matched funds. There are also legal limits on the amount that can be invested in each investment category: EUR 5,648 for MTCS, 3,138 for MTOA, and 6,276 for LTOA. Thus, an employee working with a firm offering all three categories of investment options could receive up to EUR 11,924 in matching contributions.

1.2 Measuring the Complexity of PEE and PERCO Matching

We classify the complexity of the matching systems at different firms into four categories:
* "extra simple" (complexity level = 0) if the firm has a single constant match rate that applies to all investment options.

* "simple" (complexity level = 1) if the firm has a single formula, with at least two rates, for all matched funds.

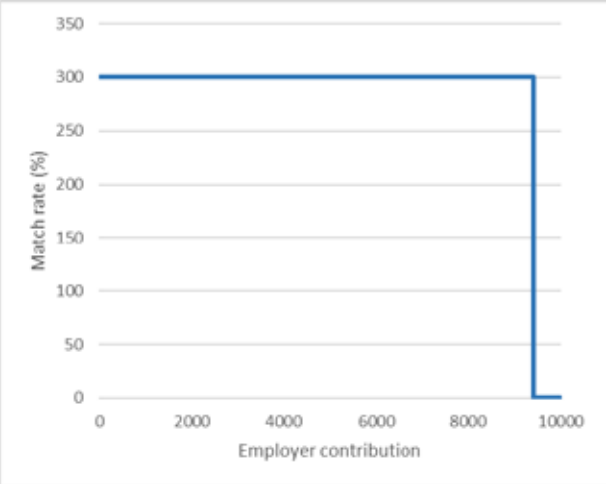
* "semi-complex" (complexity level = 2) if the firm has at least two different matching formulae but all formulae involve flat rates.

* "complex" (complexity level = 3) if the firm has multiple formulas, and multiple rates in at least one formula.

Four examples illustrate the range of possible match regimes.

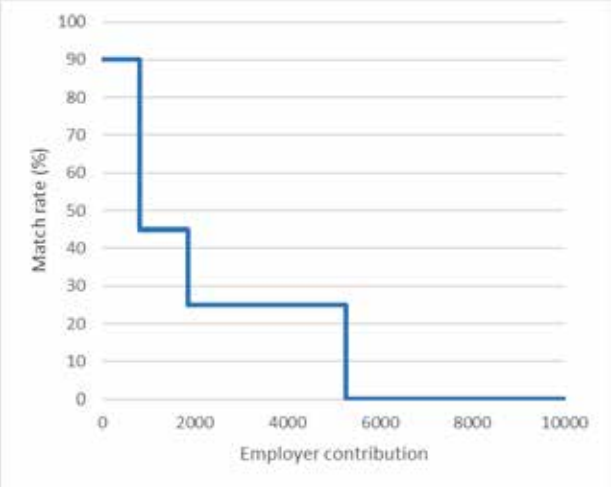
Firm A uses an extra simple rule with a 300% match rate applicable to any contribution up to the legal ceiling, which is EUR 9,414, corresponding to EUR 3,138 for the employee contribution, because the firm A matches medium-term investment (PEE) in an MTOA and does not match company stock. The only investment option in the plan is a bond fund.

Figure 2: Firm A's extra-simple matching program



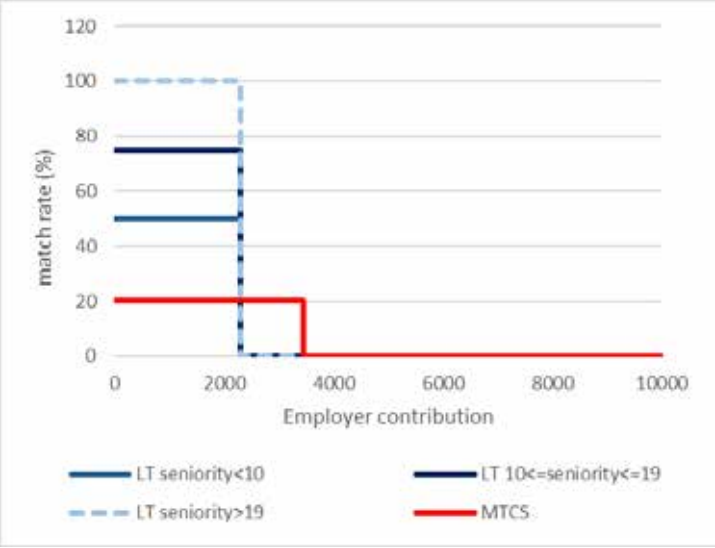
Firm B offers a simple matching environment, matching all contributions in its plan up to the statutory limits. It offers 12 medium-term funds (PEE) are matched with the same decreasing match rate which starts at 90% (see Figure 3). The investable funds concern various asset classes: two in the money market, two in bonds, three in equity, and five diversified funds. An employee can choose to invest in any combination of these funds, and will benefit from the decreasing match rate described in Figure 3. The firm may not contribute more than the legal ceiling of EUR 9,414; the employee should contribute EUR 19,580 to leave no money on the table.

Figure 3: Firm B's simple matching program



Firm C matches both medium- and long-term savings (see Figure 4), but does so at different rates. It provides a 20% match on investment in a medium-term company-stock fund (MTCS) up to a ceiling of EUR 3450. In addition, the employees may also invest variable remuneration and additional contributions in the medium-term saving vehicle (MTOA), which offers four non-matched funds, including one money-market fund and three diversified funds. The firm also offers seven matched funds as part of its long-term other assets (LTOA) option. These funds include: one money-market fund, one bond fund, one international-equity fund, and four diversified funds. The maximal match rate depends on employee's seniority in the firm: 100% for employees with over 19 years of employment at the firm, 75% for seniority between 10 and 19 years, and 50% for employees with less than 10 years at the firm. The ceiling for LTOA is EUR 2,300. The matching program is characterized as "semi-complex" since it consists of three formulas with flat rates. The employee contribution necessary to collect the full match is EUR 17,250.

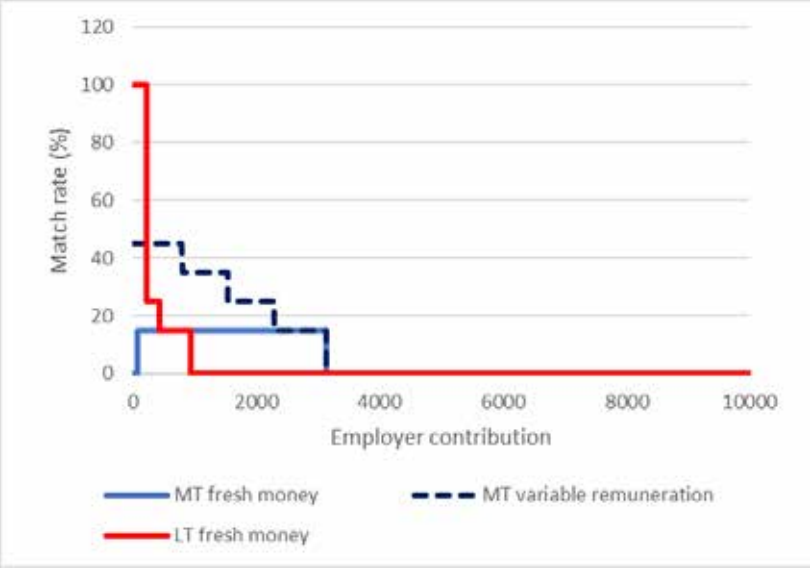
Figure 4: Firm C's semi-complex matching program



Finally, Firm D uses a complex matching rule that involves three formulas, two of which having multiple tranches (see Figure 5). For medium-term investments in the PEE, the match rate depends on whether the employee's contribution comes from her variable remuneration or from an additional employee contribution. The variable remuneration invested in the plan benefits from a decreasing match rate, starting at 45%, with a legal ceiling of EUR 3,138, which

corresponds to a contribution of EUR 17.820 from the employee. The firm also offers a special match rate of 15% on voluntary contributions of at least EUR 80 up to the EUR 3,138 ceiling; to take full advantage of this match, the employee must save EUR 20,920. The firm offers seven investment options: two bond funds, one diversified equity fund, and four diversified funds. Contributions to all funds are matched. In addition, long-term investment (PERCO) contributions are matched according to a different formula that starts with a higher rate (100%) but decreases faster (0% at EUR 940).

Figure 5: Firm D's complex matching program



2. Data

We analyze data drawn from administrative records at Amundi. The data contain information on employee savings observed at year-end 2016 and throughout 2017. Amundi is the largest provider of DC plans in France, its market share in such plans is about 34%. Information on the saving choices of the 1,195,105 employees of firms in the sample was combined by data on their employers from the French public statistical institute INSEE. There are 22,667 firms in our sample.

All of the individuals in the sample have access to variable compensation programs and to DC plans, while only 45% have access to matching contributions. To provide summary statistics,

we create three groups of firms: large firms (over 50 employees),[4] which are statutorily obliged to give variable compensations to their employees; medium firms (from 3 to 50 employees); and small firms, with less than 3 employees. The latter group are likely to be owned and managed by the same person.

Table 1: Descriptive Statistic on Firms (Means)

	Firms without matching N=6151	Firms with matching N=16516
Nb of employees	192.21	104.53
Mean age of employees (years)	49.18	48.65
% of female employees	0.38	0.45
Average assets in plan (EUR)	15173.92	27199.86
Dispersion of assets in plan (EUR)	13909.01	11430.81
Mean variable remuneration received in the plan (EUR)	679.10	572.99
Dispersion of variable remuneration in the plan (EUR)	298.47	180.74
Firm belongs to SBF120	0.03	0.02

Table 2: Descriptive Statistics on Employees (N = 1195105)

Variable	p25	Mean	p50	p75
Panel A: Employee's characteristics				
Age	36.00	44.63	45.00	54.00
Female (Y/N)	0	0.32	0	1.00
Total assets (EUR)	926.44	21372.29	4999.35	20033.50
Variable remuneration received in 2017 (EUR)	0.00	1288.92	284.50	1472.07
Panel B: Investment decisions				
Individual takes match (Y/N)	0	0.45	0.00	1.00
Amount left on the table (EUR) (N = 765677)	0	1155.17	0.00	700.00
Nb personal contributions to the plan/year	0	1.464086	0	1
Contribution amount (EUR)	0	650.702	0	404.35
Nb redemptions/year	0	0.180808	0	0
Redemption amount (EUR)	0	1577.127	0	0
Panel C: Proxies for liquidity constraint				
1) Cashed-in variable remuneration (Y/N)	0	0.10	0.00	0.00
2) Cashed-in variable remuneration amount	0	153.402	0	0
Panel D: Proxies for attention				
1) Nb connexions to the website/year	0	5.63	1.00	4.00
2) Time spent (hours/year)	0	0.64	0.02	0.70
3) Nb reallocations/year	0	0.65	0.00	0.00

[4] This classification is motivated by the regulatory requirement that imposes that firms with more than 50 employees distribute variable compensation. Our definition of "large firm" departs significantly from the French legal terminology according to which a large company has at least 500 employees and/or at least EUR 50M turnover.

Table 3: Descriptive Statistics on DC Plans at Firms of Different Size

	p25	Mean	p50	p75
Large Firms (N = 401)				
Nb funds	6.00	10.16	8.00	12.00
Number of tranches	1.00	1.82	1.00	2.86
Nb match rules	1.00	1.94	1.00	2.00
Complexity (scale of 0 to 3)	0.00	1.30	1.00	2.00
First-euro match rate (%)	50.00	115.97	100.00	150.00
First-euro match rate MTCS (%) (N=130)	0.00	57.81	55.00	65.00
First-euro match rate MTOA (%)	0.00	78.59	50.00	100.00
First-euro match rate LTOA (%) (N = 270)	40.00	113.81	100.00	200.00
Match ceiling (EUR)	600	3324.16	2200	4000
Match ceiling MTCS (EUR) (N = 130)	0	2187.08	1403	5648.83
Match ceiling MTOA (EUR)	150	1414.52	1050	3138.24
Match ceiling LTOA (EUR) (N = 270)	450	2402.72	1000	6276.48
Default fund matched (Y/N)	0.00	0.71	1.00	1.00
Firm communicates about match (Y/N)	1.00	0.84	1.00	1.00
Medium Firms (N – 4081)				
Nb funds	3.00	5.22	4.00	6.00
Number of tranches	1.00	1.06	1.00	1.00
Nb match rules	1.00	1.33	1.00	2.00
Complexity (scale of 0 to 3)	0.00	0.62	0.00	2.00
First-euro match rate (%)	200.00	247.99	300.00	300.00
First-euro match rate MTCS (%) (N = 14)	0.00	53.93	55.00	100.00
First-euro match rate MTOA (%)	200.00	243.79	300.00	300.00
First-euro match rate LTOA (%) (N=2009)	300.00	262.06	300.00	300.00
Match ceiling (EUR)	3138.24	5365.53	3138.24	9414.72
Match ceiling MTCS (EUR) (N = 14)	0	2789.31	2487.5	5648.83
Match ceiling MTOA (EUR)	2300	2625.09	3138.24	3138.24
Match ceiling LTOA (EUR) (N=2009)	6276.48	5557.9	6276.48	6276.48
Default fund matched (Y/N)	0.00	0.02	0.00	0.00
Firm communicates about match (Y/N)	1.00	0.81	1.00	1.00
Small Firms (N = 6505)				
Nb funds	1.00	3.32	3.00	4.00
Number of tranches	1.00	1.01	1.00	1.00
Nb match rules	1.00	1.41	1.00	2.00
Complexity (Scale of 0 to 3)	0.00	0.76	0.00	2.00
First-euro match rate (%)	300.00	272.81	300.00	300.00
First-euro match rate MTCS (%) (N=1)	120.00	120.00	120.00	120.00
First-euro match rate MTOA (%)	300.00	270.09	300.00	300.00
First-euro match rate LTOA (%) (N=3939)	300.00	277.78	300.00	300.00
Match ceiling (EUR)	3138.24	6588.62	9414.72	9414.72
Match ceiling MTCS (EUR) (N=1)	400.00	400.00	400.00	400.00
Match ceiling MTOA (EUR)	3138.24	2951.82	3138.24	3138.24
Match ceiling LTOA (EUR) (N =3939)	6276.48	6005.94	6276.48	6276.48
Default fund matched (Y/N)	0.00	0.00	0.00	0.00
Firm communicates about match (Y/N)	1.00	0.89	1.00	1.00

Figure 1a: First Dollar Match Rate Distribution: Large Firms

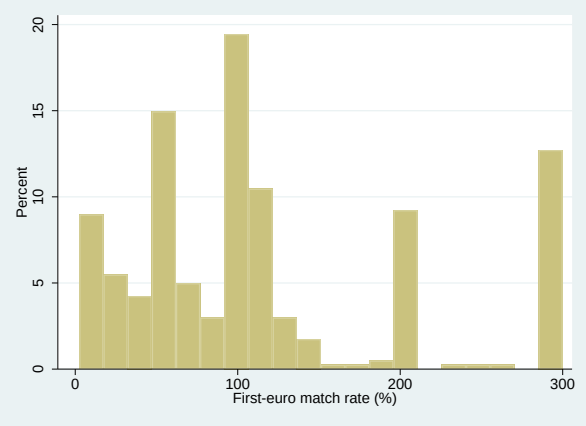


Figure 1b: First Dollar Match Rate Distribution for Medium Firms

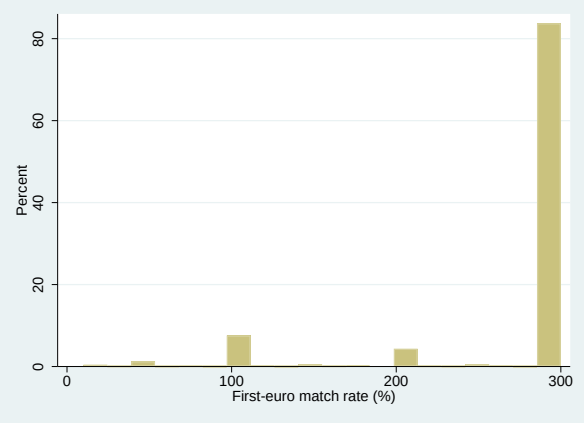


Figure 1c: First Dollar Match Rate Distribution in Small Firms

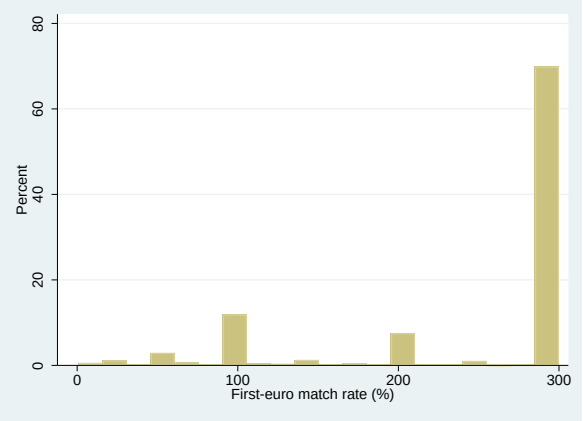


Figure 2a: Distribution of Match Complexity at Large Firms

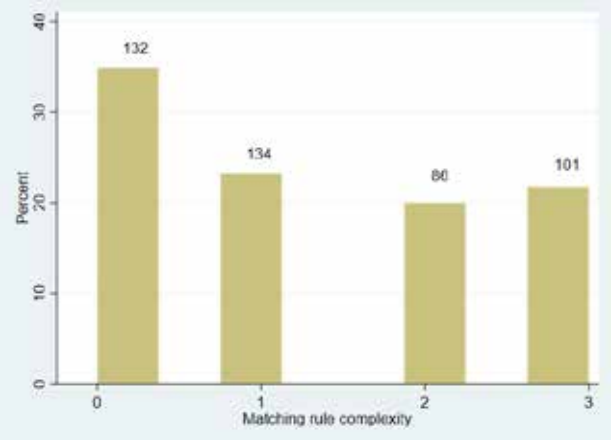


Figure 2b: Distribution of Match Complexity at Medium Firms

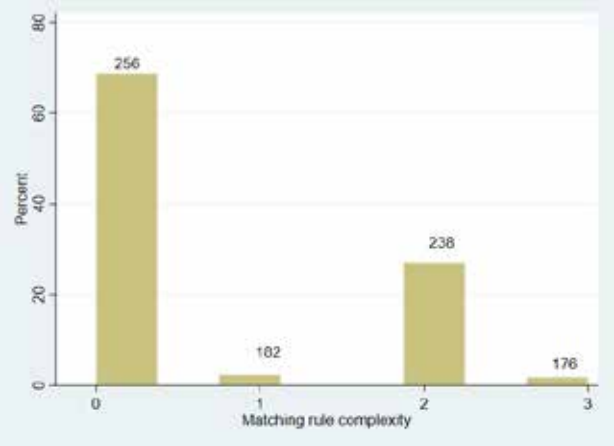


Figure 2c: Distribution of Match Complexity at Small Firms

