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# Pension Fund Participation and Contribution in Italy: An Intra-Couple Decision?<sup>†</sup>

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## Abstract

This study analyzes participation in and contributions to pension fund in Italy from an intra-couple perspective, testing three alternative decision-making models: the atomistic model, the unitary model with fiscal optimization, and the cooperative model with limited commitment. Based on the Bank of Italy's Survey on Household Income and Wealth data (2008–2022), the bivariate econometric analysis (probit and Tobit) reveals a strong positive correlation between partners choices at both the participation and contribution margins, rejecting both the atomistic model (predicting no correlation) and the unitary model with fiscal optimization (predicting concentration of contributions on the higher-earning spouse). Decomposing the conditional correlation into a permanent and a transitory component highlights active and simultaneous coordination within the couple. In sum, results reject the atomistic and unitary models and are consistent with cooperative models with limited commitment. In particular, the pattern of coefficients in the contribution equations — where indicators of the wife's stronger economic position are associated with lower contributions to her account — is suggestive of a protective allocation motive, whereby the couple channels more resources to the more financially vulnerable partner. In terms of policy implications, results suggest treating the couple as the unit of analysis and reconsidering tax incentives.

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# 1 Introduction

Over the past three decades, major policy reforms have profoundly reshaped the Italian pension system, cutting first-pillar replacement rates from over 70% under the earnings-related scheme to about 60–65% under the current contributory one (Borella and Coda Moscarola 2015), and shifting more responsibility for retirement income onto individuals. In this context, supplementary pension plans (from now on pension funds) have acquired a central role in the architecture of old-age security. Yet participation remains modest and uneven according to the pension fund supervisory authority: in 2025 only about 40% of the labor force was enrolled in a pension fund, with persistent disparities across gender and geographical areas (COVIP 2025). This gap between the institutional importance of pension funds and their limited, unequal diffusion raises a fundamental question: who participates in these instruments, who contributes, and how is this decision taken?

Most of the existing empirical literature has addressed these questions by studying the decision-making process of an individual decision-maker (e.g., Huberman et al., 2007; Gallo et al., 2018; Madrian and Shea, 2001; Choi et al., 2001; Cronqvist and Thaler, 2004; Fornero and Monticone, 2011), with a few exceptions that have adopted the household as the unit of analysis, while still treating it as a unitary model (e.g., Torricelli et al., 2016). More recently a small but growing body of research has turned its attention to the *intra-couple* level, studying the coordination mechanisms between partners and their influence on participation, contribution, and saving allocation decisions in pension funds, focusing on Germany (Metzger, 2018), United States (Choukhmane et al., 2025; Derby et al., 2023), Korea (Yang et al., 2025) and Australia (Austen et al., 2026).

Against this backdrop, this paper studies participation in and contributions to pension funds in Italy from an *intra-couple* perspective in order to address two main research questions: whether an *intra-couple* perspective is more appropriate than an individual one for analyzing pension fund participation and contributions, and, if so, which family model (unitary or cooperative) best represents these decisions. The Italian institutional context is ideal for an empirical investigation of these issues for three main reasons: (i) the tax deductibility of pension fund contributions, which creates a fiscal incentive to concentrate savings on the main income earner (facing the highest marginal tax rate); (ii) strictly individual pension fund positions — with freely designated beneficiaries and no automatic sharing upon divorce, even under community of property — that make the titularity of the account economically meaningful; (iii) strong heterogeneity in pension fund coverage and employer matching across sectors. These characteristics

make intra-couple dynamics in decisions about participation in and contribution to pension funds especially important to study.

This paper makes three main contributions. First, we bring together three theoretical approaches to pension-fund choices: a purely individual (atomistic) approach that ignores household membership; a unitary approach, which treats the household as a single agent with an aggregate utility function; and a cooperative collective approach with limited commitment (Mazzocco, 2007), encompassing both self-insurance against divorce risk (Lee and Pockock, 2007) and joint protection of the more financially vulnerable partner. For each, we derive testable implications. Second, we test these implications on a cross-section of 9,926 couple-year observations from the 2008–2022 waves of the Bank of Italy’s Survey on Household Income and Wealth. Third, we exploit the survey’s panel structure (6,125 couples observed over multiple waves) to decompose within-couple correlation into a permanent component (stable coordination) and a transitory component (coordination in contemporaneous decisions).

We find that: (i) participation decisions are positively correlated across partners, beyond individual and household characteristics, in both the permanent and the transitory components; (ii) the same holds for contribution levels (again in both components); and (iii) couples do not fully exploit tax deductibility by concentrating contributions on the higher earner. The coordination is not confined to a stable couple trait: the positive transitory correlation shows that partners co-move in their contemporaneous decisions, which weighs against a purely selective explanation such as assortative mating and points to active coordination within the couple. Overall, the evidence rejects the atomistic and the unitary-fiscal approaches. It is consistent with cooperative models with limited commitment that predict crowding-in. Moreover, the coefficient pattern in the contribution equations — where indicators of the wife’s economic strength are negatively associated with contributions to her own account — is suggestive of a protective allocation channel, whereby the couple directs resources towards the more financially vulnerable partner. As far as we know, this is the first paper to adopt an intra-couple perspective in the study of participation and contribution choices to pension funds in Italy.

The remainder of the paper is organized as follows. Section 2 presents the relevant literature on pension fund choices. Section 3 describes the institutional and theoretical framework. Section 4 presents the data and Section 5 the empirical strategy. Section 6 reports the cross-sectional correlation results and robustness checks. Section 7 decomposes the correlation into permanent and transitory components. Section 8 concludes.

## 2 Background literature

Most existing empirical literature treats pension fund participation as an individual decision, drawing on life cycle and precautionary saving theory (Friedman, 1957; Modigliani and Brumberg, 1954; Kimball, 1990; Carroll and Samwick, 1998) and on household-finance research on limited stock-market participation (Haliassos and Bertaut, 1995; Heaton and Lucas, 2000; Cocco, 2004).

Empirical studies on pension fund participation from an individual point of view identify a stable set of determinants. Income and wealth are robust predictors, reflecting liquidity constraints and expectations about public pension replacement rates (Huberman et al., 2007). Italian evidence confirms this (Fornero and Monticone, 2011; Rinaldi, 2011; Gallo et al., 2018). Recent empirical evidence also shows that uncertainty about social security benefits increases supplementary retirement saving (Jappelli et al., 2020). Financial literacy (especially pension-specific knowledge) is another key determinant, with evidence of a causal positive effect on participation internationally and in Italy (Lusardi and Mitchell, 2007; Lusardi and Mitchell, 2011; Fornero and Monticone, 2011; Castagno et al., 2025; Rooij et al., 2012; Bucher-Koenen and Lusardi, 2011). Studies also find a persistent gender gap in participation, only partly due to labor market differences and partly due to gaps in financial literacy (Lusardi and Mitchell, 2008; Alemanni et al., 2026; Angelici et al., 2022). Evidence from Great Britain further shows that the gender gap in wealth is substantially wider once private pension wealth is accounted for, and that it is largely driven by differences in labour market histories (Nolan and Palomino, 2026), which highlights the importance of measuring pension positions at the individual rather than the household level.

From a behavioral perspective, automatic enrollment in the United States and Sweden substantially and persistently increased participation (Madrian and Shea, 2001; Choi et al., 2001; Cronqvist et al., 2018; Cronqvist and Thaler, 2004), whereas Italy's 2007 opt-out scheme had much weaker effects, largely offset by firms' incentives to retain severance pay (TFR) as internal finance (Rinaldi, 2011; Gallo et al., 2018). Finally, social norms and peer effects transmitted through networks significantly influence enrollment (Duflo and Saez, 2002, 2003; Kleinheinz et al., 2025). Recent evidence from India on the contributory scheme Atal Pension Yojana shows that enrollment crowds in, rather than displaces, other forms of formal retirement saving (Rooj and Sengupta, 2024)

The literature mentioned so far treats participation in pension funds as an individual choice, ignoring intra-household coordination. A different household-economics literature instead models saving at the couple level, which motivates this paper. In a non-cooperative Nash setting, Browning (2000) shows that gender gaps in life expectancy and age create differences in spouses' discount rates, making household

saving depend on intra-household income shares, while remaining Pareto-efficient and consistent with cooperative collective models. In a cooperative framework with divorce risk as the threat point, Lee and Pockock (2007) predict that positive divorce risk encourages saving in individually controlled accounts and that greater wife bargaining power raises both her saving share and total household saving.

While empirical studies on the allocation of generic wealth within couples are well developed (e.g., Grabka et al., 2013; Pak and Babiary, 2018; Warren, 2006; Kukk and Raaij, 2021), applications to pension fund choices are still scarce yet increasing. Metzger (2018) provides the first non-unitary evidence, finding substantial crowding-in between German spouses' participation and contributions beyond tax optimization. The author studies intra-couple dependence using cross-sectional data, without separating coordination that is a stable trait of the couple from coordination in partners' contemporaneous decisions. Yang et al. (2025) show for Korea that intra-couple bargaining power shapes participation and contributions in ways inconsistent with unitary tax-efficiency maximization, while Choukhmane et al. (2025) find that many U.S. couples do not allocate contributions efficiently across employer matches, indicating both mistakes and weak intra-household commitment. Also Austen et al. (2026) find evidence in Australia that question the assumption of Pareto-efficiency implicit in the unitary model. In contrast, Derby et al. (2023) find no spousal spillovers from automatic enrollment in the United States, consistent with passive behavior by default-enrolled workers.

### 3 Institutional and Theoretical Framework

The Italian supplementary pension system has two pillars. The second pillar includes contractual pension funds, created by collective bargaining for specific worker categories (e.g., metalworkers, construction, communications, commerce). These differ from third-pillar funds because: (i) only employees in the relevant sector may enroll; (ii) members can transfer their severance pay (TFR) into the fund<sup>1</sup>; (iii) if they contribute beyond TFR, they may receive employer matching, whose amount and access conditions vary by fund. Employer matching is usually a percentage of gross annual salary, triggered by paying at least a minimum contribution in addition to TFR. The third pillar consists of open pension funds and individual pension plans (from insurance companies). Enrollment is open to all: employees, self-

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<sup>1</sup> The *Trattamento di Fine Rapporto* (TFR) is a mandatory deferred compensation scheme unique to the Italian labor market. Under Italian law, employers must set aside about 6.91% of each employee's gross annual pay for the duration of employment. This amount is revalued annually at 1.5% plus 75% of inflation and paid as a lump sum at termination, whether due to resignation, dismissal, or retirement. Historically, TFR operated as forced saving managed by the firm, which used the funds as internal financing. Following the 2005–2007 reforms (Legislative Decree No. 252/2005), employees could (and new hires were automatically enrolled to) redirect future TFR accruals to pension funds.

employed, unemployed people, and dependent household members. The main mechanism used to incentivize participation in the third pillar is the tax deductibility of contributions, up to an annual limit of €5,164.57. According to COVIP (2025), only about 10% of pension fund members fully exploit this deduction ceiling. From a purely tax-optimization perspective, the deductibility of contributions creates a fiscal incentive to concentrate household payments into the fund held by the individual with the highest income (and therefore subject to the highest marginal tax rate, given the progressive nature of the Italian tax system).

Pension fund positions are individual and registered in each member's name. Unlike assets in the marital community of property, they remain under the exclusive control of the holder and therefore do not become fungible between partners upon divorce. At retirement, members may choose among a lump sum (up to 100% of the balance if the resulting annuity falls below a regulatory threshold, otherwise up to 50%), a life annuity — which may be single-life or joint-and-survivor, at the member's option — or leave the accumulated balance in the fund. Importantly, if a member chooses a single-life annuity and subsequently dies, the surviving partner loses the entire income stream; had the same euros been contributed to the survivor's own fund, they would have remained available. If the member dies before retirement, the full accrued balance goes to designated beneficiaries — who are freely chosen by the member and need not coincide with legal heirs — or, absent a designation, to legal heirs, in both cases under favorable tax rules. Because each partner's beneficiary designation may differ without the other's knowledge, the pension fund confers a degree of individual autonomy that is absent from other jointly held assets such as bank accounts.

Against this institutional setting and resting on different theoretical decision frameworks typical of the household economics literature, we can formulate three main hypotheses regarding individuals' decisions to participate in and contribute to pension funds within a couple. Two key features of the institutional setting shape the theoretical predictions: first, the progressive tax system creates an incentive to concentrate contributions on the higher earner; second, the strictly individual and non-transferable nature of pension fund positions means that the titularity of the account has economic content whenever future intra-couple transfers are uncertain — whether because of divorce, death, or imperfect annuity markets.

Within the atomistic framework, which has been the dominant approach in the empirical literature to date and explicitly abstracts from individuals' household membership, preferences are modeled as entirely idiosyncratic, and the partner's decisions are assumed not to affect an individual's own choices.

Consequently, aside from correlations arising through assortative mating, one would expect to find *no statistically significant correlation* between partners' participation and contribution decisions.

Under the unitary household model with fiscal optimization, the household is assumed to maximize a single, joint utility function. Because partners can commit to intra-household transfers and the tax system is progressive, the household should concentrate contributions in the account of the partner facing the highest marginal tax rate (or, equivalently, reduce the lower earner's contributions to zero when the couple's total falls below the individual deduction ceiling). Empirically, this implies a negative intra-couple correlation in contributions: the more one partner contributes, the less the other does, as the household channels savings into the most tax-efficient account.

By contrast, cooperative models with limited commitment (Mazzocco, 2007) introduce a countervailing force: because pension wealth is individually held and non-transferable upon separation, and because partners cannot credibly commit to future state-contingent transfers, the titularity of the pension position acquires economic value. Within this family of models, two channels predict a positive intra-couple correlation. First, self-insurance against divorce risk (Lee and Pockock, 2007): each partner has an incentive to accumulate in their own individual account as insurance against relationship dissolution, since pension fund balances remain under exclusive control in that event. Second, joint protection of the more financially vulnerable partner: when one partner — typically the wife — faces weaker first-pillar coverage, lower earnings, greater longevity risk, or lacks access to survivor benefits (as is the case for unmarried cohabiting partners), the couple may channel relatively more resources into her individual account as a form of precautionary allocation. This second channel is reinforced by the imperfect nature of annuity options: if the higher-earning partner chooses a single-life annuity and dies, the surviving spouse loses the entire income stream, whereas contributions made to the survivor's own fund remain fully available. Both channels share the theoretical prediction of a positive correlation between partners' participation and contribution decisions. They can be partially discriminated through the coefficient pattern: self-insurance predicts that contributions increase with the partner's own bargaining power (primary earner, financial decision-maker), whereas protective allocation predicts the opposite — that indicators of the wife's stronger economic position are associated with lower contributions to her account, because the couple directs resources towards the more exposed partner.

In sum, the household-economics literature thus offers divergent predictions depending on the theoretical decision model assumed, as we summarize in Table 1, which we will keep as a reference in our empirical strategy by testing the sign of the relevant coefficients:

**HP1 (Atomistic):** The preferences of the two partners are idiosyncratic, and they do not coordinate their decisions. The correlation between their choices regarding contributions to and participation in pension funds is zero, once controlled for individual and family characteristics.

**HP2 (Unitary with fiscal optimization):** The partners maximize a single utility function by concentrating their contributions to pension funds on the partner with the higher marginal tax rate. The correlation between their contribution choices is negative. When the couple’s total contribution falls below the individual deduction ceiling of the higher earner, the model predicts zero contributions by the lower earner.

**HP3 (Cooperative with limited commitment):** The two partners have distinct preferences and face limited commitment. Because pension fund positions are individual and non-transferable, the titularity of the account has economic value. The correlation between their choices is positive (crowding-in). Within this family, self-insurance against divorce risk (HP3a) predicts that contributions increase with the partner’s own bargaining power, whereas joint protection of the exposed partner (HP3b) predicts that contributions to the wife’s account decrease with indicators of her economic strength.

**Table 1. Pension fund participation and contributions:  
Theoretical predictions for intra-couple correlation**

| Decision model                      | Hypothesis on intra-couple correlation |
|-------------------------------------|----------------------------------------|
| Atomistic                           | None                                   |
| Unitary                             | Negative (crowding-out)                |
| Cooperative with limited commitment | Positive (crowding-in)                 |

*Notes:* “None” denotes no systematic correlation beyond assortative mating.

In the remainder of this paper, we test these hypotheses on a representative sample of Italian households.

## 4 Data, Variables and Descriptive Statistics

We use the Bank of Italy’s Survey on Household Income and Wealth (SHIW) (Bank of Italy, 2025), a biennial survey, with a rotating panel design, representative of the Italian resident population that collects detailed demographic, occupational, and financial information on households and their members. Although interviews are administered at the household level, key questions are asked of individual members,

yielding an individual-level dataset that preserves each person’s link to their household. We use the seven waves from 2008 to 2022 for which the survey records individual ownership of a pension fund and the amount contributed. The dataset provides survey weights that are used in the regressions.

In constructing the estimation sample, we first retain individuals who are in employment. We keep both dependent employees and the self-employed, since third-pillar instruments are open to the self-employed as well. We recode a residual set of observations with an unclassifiable sector of economic activity into a “Other” category that serves as the reference group. To construct the couple sub-sample, we include opposite-sex couples who are either legally married or in a *de facto* relationship. The final estimation sample consists of 9,926 couple-year observations drawn from 6,125 distinct couples observed across the seven waves.

We study two outcomes. The first is participation, a binary variable equal to one if the individual owns a pension fund and zero otherwise, defined separately for the husband ( $pf_h$ ) and the wife ( $pf_w$ ). The second is the contribution, the annual amount paid into the individual’s pension fund, in real terms at 2015 prices, denoted  $cont_h$  and  $cont_w$ . The contribution analysis is conducted on the sub-sample of couples in which both partners participate and have a non-missing contribution. It comprises 830 couple-year observations from 635 couples.

The set of control variables follows the Italian literature on pension fund participation, particularly Gallo et al. (2018). Exact variable definitions are in Appendix A. Individual covariates include demographics, human capital (high-school diploma and university degree, with lower education as the reference), sector of economic activity (ten categories, with “Other” as the reference), a dummy for self-employment, log real labor income, and two more dummies: whether the individual is the self-declared household financial decision-maker (a proxy of bargaining power in Italian couples following Bertocchi et al., 2014) and whether they are the primary income earner. The contribution equations also control for the presence of employer matching on the worker’s own pension fund.

Household-level controls, identical for both partners by construction, include legal marital status, residence in the South, municipality size, household size, homeownership, ownership of a private family business, household net-wealth quintile, household income quintile, and survey-year fixed effects.

Table 2 reports descriptive statistics separately for husbands and wives, by their own pension fund participation status. Table 3 reports the joint distribution of participation. Figure 1 shows the distribution of contributions in couples in which both partners participate.

**Table 2. Descriptive statistics by pension fund participation status**

|                          | Husband       |               |               | Wife          |               |               |
|--------------------------|---------------|---------------|---------------|---------------|---------------|---------------|
|                          | Non-part.     | Part.         | Total         | Non-part.     | Part.         | Total         |
| <b>Individual char.</b>  |               |               |               |               |               |               |
| Age                      | 49.61 (9.24)  | 49.06 (7.99)  | 49.49 (8.98)  | 46.63 (8.97)  | 46.40 (7.97)  | 46.59 (8.81)  |
| High school              | 0.381 (0.486) | 0.388 (0.487) | 0.382 (0.486) | 0.393 (0.488) | 0.412 (0.492) | 0.396 (0.489) |
| University               | 0.260 (0.439) | 0.354 (0.478) | 0.281 (0.449) | 0.324 (0.468) | 0.406 (0.491) | 0.337 (0.473) |
| Log income               | 10.19 (0.77)  | 10.53 (0.70)  | 10.27 (0.77)  | 9.70 (0.86)   | 10.01 (0.57)  | 9.75 (0.83)   |
| Financial decision-maker | 0.661 (0.473) | 0.757 (0.429) | 0.682 (0.466) | 0.304 (0.460) | 0.385 (0.487) | 0.318 (0.466) |
| Primary earner           | 0.751 (0.433) | 0.829 (0.377) | 0.768 (0.422) | 0.209 (0.407) | 0.242 (0.429) | 0.215 (0.411) |
| <b>Household char.</b>   |               |               |               |               |               |               |
| Married                  | 0.927 (0.260) | 0.931 (0.253) | 0.928 (0.259) | 0.928 (0.259) | 0.927 (0.260) | 0.928 (0.259) |
| South                    | 0.280 (0.449) | 0.168 (0.374) | 0.255 (0.436) | 0.275 (0.447) | 0.158 (0.364) | 0.255 (0.436) |
| Big municipality         | 0.173 (0.378) | 0.190 (0.392) | 0.177 (0.382) | 0.173 (0.378) | 0.197 (0.398) | 0.177 (0.382) |
| Small municipality       | 0.221 (0.415) | 0.231 (0.421) | 0.223 (0.416) | 0.219 (0.414) | 0.243 (0.429) | 0.223 (0.416) |
| Household size           | 3.397 (0.984) | 3.420 (0.932) | 3.402 (0.973) | 3.395 (0.970) | 3.440 (0.985) | 3.402 (0.973) |
| Homeowner                | 0.794 (0.405) | 0.869 (0.338) | 0.810 (0.392) | 0.800 (0.400) | 0.861 (0.346) | 0.810 (0.392) |
| Business owner           | 0.327 (0.469) | 0.247 (0.431) | 0.309 (0.462) | 0.313 (0.464) | 0.288 (0.453) | 0.309 (0.462) |
| <b>Employment</b>        |               |               |               |               |               |               |
| Self-employed            | 0.323 (0.468) | 0.228 (0.420) | 0.302 (0.459) | 0.190 (0.393) | 0.129 (0.335) | 0.180 (0.384) |
| Agriculture              | 0.041 (0.198) | 0.016 (0.125) | 0.035 (0.184) | 0.032 (0.176) | 0.013 (0.115) | 0.029 (0.168) |
| Industry                 | 0.185 (0.388) | 0.265 (0.441) | 0.202 (0.402) | 0.102 (0.303) | 0.127 (0.333) | 0.106 (0.308) |
| Construction             | 0.081 (0.273) | 0.046 (0.210) | 0.073 (0.261) | 0.011 (0.104) | 0.008 (0.092) | 0.011 (0.102) |
| Trade and Horeca         | 0.152 (0.359) | 0.105 (0.307) | 0.141 (0.348) | 0.167 (0.373) | 0.141 (0.348) | 0.163 (0.369) |
| Transport/Communic.      | 0.070 (0.254) | 0.076 (0.265) | 0.071 (0.257) | 0.030 (0.170) | 0.035 (0.183) | 0.030 (0.172) |
| Finance/Insurance        | 0.036 (0.186) | 0.140 (0.347) | 0.059 (0.236) | 0.030 (0.170) | 0.119 (0.324) | 0.045 (0.207) |
| Real estate/Services     | 0.095 (0.293) | 0.111 (0.314) | 0.098 (0.298) | 0.091 (0.288) | 0.090 (0.287) | 0.091 (0.288) |
| Private services         | 0.101 (0.301) | 0.086 (0.280) | 0.097 (0.296) | 0.139 (0.346) | 0.106 (0.308) | 0.134 (0.341) |
| Public adm./Health       | 0.230 (0.421) | 0.148 (0.355) | 0.212 (0.409) | 0.389 (0.488) | 0.353 (0.478) | 0.383 (0.486) |
| Other                    | 0.010 (0.101) | 0.007 (0.085) | 0.010 (0.098) | 0.008 (0.090) | 0.008 (0.088) | 0.008 (0.090) |

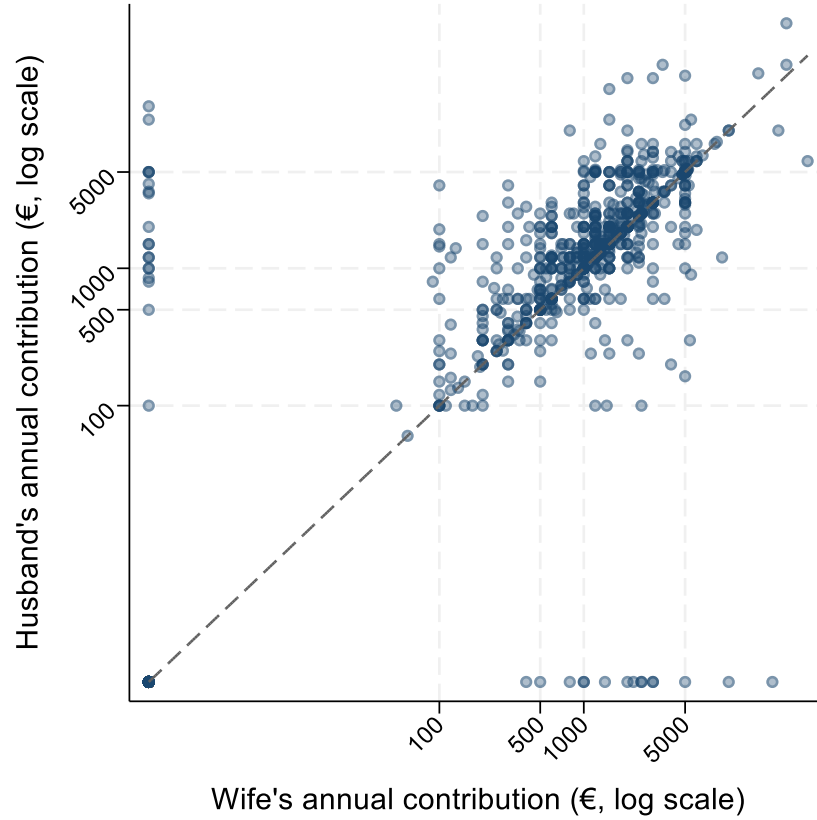
*Notes:* Means with standard deviations in parentheses. “Husband” and “Wife” columns report statistics by the respective partner’s pension fund participation status. “Non-part.” and “Part.” denote non-participants and participants; “Total” pools both. Sample: 9,926 couple-year observations, SHIW 2008–2022.

**Table 3. Joint distribution of pension fund participation within couples**

| Husband                | Wife            |             |
|------------------------|-----------------|-------------|
|                        | Non-participant | Participant |
| <b>Non-participant</b> | 7,056 (71.09)   | 664 (6.69)  |
| <b>Participant</b>     | 1,220 (12.29)   | 986 (9.93)  |

*Notes:* Number of couples in each cell, with cell percentages of all couples in parentheses. Sample: 9,926 couple-year observations, SHIW 2008–2022.

**Figure 1. Intra-couple annual pension fund contributions**



Notes: Each dot is a couple in which both partners participate and report a non-missing contribution. Axes are on a logarithmic scale, with labels in euros at 2015 prices. The dashed line is the 45-degree line, along which the two partners contribute equal amounts.

## 5 Empirical Strategy

To test the three hypotheses outlined in Section 3 corresponding to the three intra-couple decision models (i.e. atomistic, unitary, or cooperative with limited commitment models), we estimate the sign of the conditional correlation between the two partners' choices  $\rho$ . We analyze two choices: participation and contribution. The conditional correlation between the partners' choices is estimated separately for each of them.

We proceed in two steps developed respectively in Section 6 and 7. First, on the pooled cross-section, we estimate two bivariate models (a probit for participation and a Tobit for contributions) whose error correlation  $\rho$  tests the three hypotheses on the intra-couple decision models. Second, following Alessie et al. (2004) and Miranda (2011), we exploit the (unbalanced) panel structure of the survey to re-estimate the same two models with couple-level random effects, decomposing  $\rho$  into a permanent ( $\rho_u$ ) and a transitory component ( $\rho_\varepsilon$ ).

Specifically, we model and estimate jointly the two partners' participation decisions and allow the error terms to be freely correlated:

$$\begin{cases} \text{pf}_{h,i}^* = \mathbf{x}_{h,i}'\boldsymbol{\beta}_h + \mathbf{z}_i'\boldsymbol{\gamma}_h + \boldsymbol{\delta}_{h,t} + \varepsilon_{h,i}, & \text{pf}_{h,i} = \mathbf{1}[\text{pf}_{h,i}^* > 0], \\ \text{pf}_{w,i}^* = \mathbf{x}_{w,i}'\boldsymbol{\beta}_w + \mathbf{z}_i'\boldsymbol{\gamma}_w + \boldsymbol{\delta}_{w,t} + \varepsilon_{w,i}, & \text{pf}_{w,i} = \mathbf{1}[\text{pf}_{w,i}^* > 0], \end{cases} \quad (1)$$

where  $\text{pf}_{h,i}$  and  $\text{pf}_{w,i}$  are the participation decisions of the husband and the wife in couple  $i$ ,  $\mathbf{x}_{h,i}$  and  $\mathbf{x}_{w,i}$  are the vectors of each partner's individual characteristics,  $\mathbf{z}_i$  is the vector of household-level characteristics common to both equations, and  $\boldsymbol{\delta}_{h,t}$ ,  $\boldsymbol{\delta}_{w,t}$  are survey-year fixed effects. The error terms are jointly normal, with unit variances and correlation parameter  $\rho$ . The model is estimated on the pooled cross-section, with survey-year fixed effects absorbing common time shifts and standard errors clustered at the household level.

We study the intensive margin on the sub-sample of couples in which both partners participate. A fraction of participants reports a zero contribution, so the contributions are left-censored at zero, and we estimate a bivariate Tobit in which the two contribution equations share a correlated error structure:

$$\begin{cases} \text{cont}_{h,i}^* = \mathbf{x}_{h,i}'\boldsymbol{\beta}_h + \mathbf{z}_i'\boldsymbol{\gamma}_h + \boldsymbol{\delta}_{h,t} + \theta_h m_{h,i} + u_{h,i}, & \text{cont}_{h,i} = \max(0, \text{cont}_{h,i}^*), \\ \text{cont}_{w,i}^* = \mathbf{x}_{w,i}'\boldsymbol{\beta}_w + \mathbf{z}_i'\boldsymbol{\gamma}_w + \boldsymbol{\delta}_{w,t} + \theta_w m_{w,i} + u_{w,i}, & \text{cont}_{w,i} = \max(0, \text{cont}_{w,i}^*), \end{cases} \quad (2)$$

where  $m_{j,i}$  indicates employer matching on partner  $j$ 's pension fund and  $(u_{h,i}, u_{w,i})'$  are jointly normal with correlation  $\rho$ . As above, the model is estimated on the pooled cross-section, with standard errors clustered at the household level.

The parameter  $\rho$  is the first object of interest. In both models it measures the correlation between the partners' choices, conditional on their individual and common characteristics, allowing us to test the hypotheses of Section 3 at both the extensive and the intensive margin, whereby a conditional correlation  $\rho = 0$  supports HP1 (the atomistic model),  $\rho < 0$  supports HP2 (the unitary model), and  $\rho > 0$  supports HP3 (the cooperative with divorce risk model).

The full coefficient vector carries a second, independent test. Under household tax-efficiency maximization implied in the unitary model (HP2), contributions should load onto the higher-marginal-rate partner, so the coefficients on the primary earner should be positive. Within HP3, the sign of the primary earner and financial decision-maker (a proxy of bargaining power in Italian couples, following Bertocchi et al., 2014) coefficients helps discriminate between the two sub-channels: a positive sign on bargaining-

power indicators supports self-insurance (HP3a), whereas a negative sign supports protective allocation towards the more exposed partner (HP3b).

The (unbalanced) panel structure of the survey allows us to decompose  $\rho$  into two components. Let the couple-level random effects capture each partner's permanent, wave-invariant propensity to participate in (or contribute to) a pension fund, and let the wave-specific residuals capture deviations from that propensity in each survey year. The permanent correlation,  $\rho_u$ , is the correlation between the husband's and the wife's couple-level random effects; it measures the extent to which partners share a stable, time-invariant coordination in their pension-fund choices. The transitory correlation,  $\rho_\varepsilon$ , is the correlation between the husband's and the wife's wave-specific error terms, net of the permanent component; it measures the extent to which partners align their choices contemporaneously, wave by wave, beyond any stable joint trait, and is harder to explain by assortative mating alone. This decomposition sharpens the test of the hypotheses: a transitory correlation  $\rho_\varepsilon = 0$  supports HP1 (the atomistic model),  $\rho_\varepsilon < 0$  supports HP2 (the unitary model), and  $\rho_\varepsilon > 0$  supports HP3 (the cooperative with divorce risk model).

## 6 Intra-couple correlation in participation and contributions

To test the three hypotheses, i.e. what is the intra-household decision model on the pension fund issue supported by the Italian dataset, we first estimate a bivariate probit model (participation) and a bivariate Tobit model (contribution) on the pooled cross-section.

As for pension fund participation, Table 4 reports results from the seemingly unrelated bivariate probit from Equation 1.

First, to the scope of our hypotheses testing, the focus is the conditional correlation between partners' participation decisions, which is statistically different from zero, positive and large,  $\hat{\rho} = 0.647$  (standard error 0.024), and the null of independence that is rejected ( $\chi^2(1) = 355.96, p < 0.001$ ). Hence, partners' participation choices covary even after controlling for an extensive set of individual and household characteristics and its sign supports HP3, i.e. the cooperative model with limited commitment.

**Table 4. Bivariate probit of pension fund participation**

|                                                     | Wife (pf <sub>w</sub> ) | Husband (pf <sub>h</sub> ) |
|-----------------------------------------------------|-------------------------|----------------------------|
| <b>Individual characteristics</b>                   |                         |                            |
| Age                                                 | 0.088***                | 0.139***                   |
| Age squared                                         | −0.001***               | −0.002***                  |
| High school                                         | 0.217***                | 0.056                      |
| University                                          | 0.166**                 | 0.162**                    |
| Log income                                          | 0.356***                | 0.173**                    |
| Financial decision-maker                            | 0.093                   | 0.207***                   |
| Primary earner                                      | −0.050                  | 0.043                      |
| <b>Household characteristics</b>                    |                         |                            |
| Married                                             | 0.148                   | −0.053                     |
| South                                               | −0.212***               | −0.210***                  |
| Big municipality                                    | −0.082                  | −0.055                     |
| Small municipality                                  | 0.159***                | 0.065                      |
| Household size                                      | −0.365**                | −0.023                     |
| Household size sq.                                  | 0.047**                 | 0.000                      |
| Homeowner                                           | −0.153*                 | 0.027                      |
| Business owner                                      | −0.119*                 | −0.029                     |
| <b>Employment &amp; Industry</b>                    |                         |                            |
| Self-employed                                       | −0.380***               | −0.415***                  |
| Agriculture                                         | 0.110                   | −0.197                     |
| Industry                                            | 0.282                   | 0.437**                    |
| Construction                                        | −0.141                  | 0.183                      |
| Trade and Horeca                                    | 0.140                   | 0.150                      |
| Transport/Communic.                                 | 0.068                   | 0.327                      |
| Finance/Insurance                                   | 0.741**                 | 0.895***                   |
| Real estate/Services                                | 0.132                   | 0.290                      |
| Private services                                    | 0.093                   | 0.223                      |
| Public adm./Health                                  | −0.084                  | −0.124                     |
| <b>Household wealth quintiles (ref.: 1st)</b>       |                         |                            |
| 2nd                                                 | 0.038                   | 0.162                      |
| 3rd                                                 | 0.216                   | 0.253*                     |
| 4th                                                 | 0.306**                 | 0.354***                   |
| 5th                                                 | 0.481***                | 0.471***                   |
| <b>Household income quintiles (ref.: 1st)</b>       |                         |                            |
| 2nd                                                 | 0.309                   | 0.716**                    |
| 3rd                                                 | 0.201                   | 0.668**                    |
| 4th                                                 | 0.374                   | 0.797***                   |
| 5th                                                 | 0.473                   | 0.992***                   |
| <b><math>\rho = 0.647 (0.024)</math></b>            |                         |                            |
| Wald test $\rho = 0: \chi^2(1) = 355.96, p < 0.001$ |                         |                            |
| Observations: 9,926                                 |                         |                            |

*Notes:* Seemingly unrelated bivariate probit; the two equations are estimated jointly. Standard errors clustered at the household level. Survey wave dummies included. Reference category for sector is “Other”; wealth and income quintiles are relative to the first quintile. Survey weights applied. \* $p < 0.10$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$ .

As for other controls, several coefficients are noteworthy. Age and age squared imply a concave life-cycle participation profile, consistent with the empirical literature on financial market participation (e.g., Fagereng et al., 2017). Education raises participation for both spouses, but for wives' also secondary education matters. Individual income also increases participation for both. The role of financial decision-maker, identified by Bertocchi et al. (2014) for Italian couples as a proxy for bargaining power, increases only the husband's participation. By contrast, the coefficient on being the primary earner is statistically insignificant for both partners (and negative for the wife), offering suggestive evidence against the tax-optimization hypothesis implied by the unitary model.

Household variables differ meaningfully between partners. Living in Southern Italy or on the islands reduces participation for both, in line with previous findings (e.g., Gallo et al., 2018; Bertocchi et al., 2011). Residing in a small municipality is positive and significant only for the wife. Family size is negative and significant (with a positive squared term, implying a convex profile) only for the wife, consistent with childcare constraints that fall disproportionately on women (Kleven et al., 2019). Homeownership and private business ownership are likewise negative and significant only for the wife. Overall, housing and family conditions seem to influence the wife's participation more than the husband's.

Being self-employed lowers participation for both partners, consistent with the Italian context, where employees can access negotiated pension funds, often with auto-enrollment. Among sectors, only finance and insurance significantly raise participation for both, likely reflecting higher financial literacy or better access to financial products, including pension funds. Wealth quintiles show that, for both partners, participation rises in richer households. Household income, however, follows a non-uniform pattern. Controlling for individual income, higher household income quintiles increase the husband's likelihood of participating but have no statistically significant effect on the wife's. The wife's participation thus seems driven more by her own income than by total household resources, which is hard to reconcile with the unitary model.

Although the partners' choices are clearly positively correlated, participation at the extensive margin alone cannot rule out tax optimization as predicted by the unitary model. Table 5 reports the bivariate Tobit from Equation 2 for the intensive margin.

Again, our main focus is the conditional correlation between partners' contribution, which is statistically significant, positive and sizeable,  $\hat{\rho} = 0.493$  (standard error 0.073), and the independence that is rejected ( $z = 5.61$ ,  $p < 0.001$ ). Thus, the positive association seen at the extensive margin extends to the intensive margin: given that both partners participate, their contribution amounts covary even after

controlling for extensive individual and household characteristics. As in the participation stage,  $\rho \neq 0$  rejects HP1 and  $\rho > 0$  rejects HP2 and supports HP3.

Under household tax optimization (HP2), contributions should be concentrated on the partner with the higher marginal tax rate, so coefficients on being the primary earner should be positive. We find the opposite for the wife: being the primary earner is negative and significant. For the husband, the coefficient is insignificant. This pattern provides further evidence against the tax-optimization hypothesis implied by HP2: contributions are not channeled towards the higher-earning partner.

The coefficients on being the primary earner and the financial decision-maker (a proxy of bargaining power in Italian couples, following Bertocchi et al., 2014) help discriminate within the cooperative with limited commitment family (HP3). Self-insurance against divorce risk (HP3a) predicts that bargaining power raises one's own contributions; protective allocation (HP3b) predicts the opposite. The negative and significant coefficients on the wife's primary earner and financial decision-maker status — indicating that when the wife is in a stronger relative economic position, less flows into her pension account — are consistent with HP3b: the couple appears to allocate relatively more to the partner who is more financially vulnerable.

Other controls mainly resemble the participation estimates. Individual income strongly and significantly predicts contributions for both partners, with a larger effect for the husband. The husband's age has a concave effect; the wife's age is insignificant. Education is insignificant for both. The financial decision-maker coefficient is negative for both, so contributions do not concentrate on the partner controlling household finances. Being self-employed raises contributions for both. Self-employed workers are not subject to automatic enrollment and do not have access to collectively bargained pension funds. It is reasonable to assume that anyone who participates under these conditions is highly motivated and inclined to save. Moreover, the Italian public pension system is known to be less generous to self-employed workers than to private-sector employees. Employer matching does not significantly affect own contributions for either partner. This is in line with the way matching works as described in Section 3.

Household variables again differ between partners. Family size is now negative and significant for the husband (with a positive squared term). Being married raises the husband's contributions but leaves the wife's unchanged. Neither the sectoral dummies nor the wealth and income quintiles are individually significant once individual income is controlled for, indicating that the intensive margin is driven mainly by own income.

**Table 5. Bivariate Tobit of pension fund contributions**

|                                                                                  | Wife (cont <sub>w</sub> ) | Husband (cont <sub>h</sub> ) |
|----------------------------------------------------------------------------------|---------------------------|------------------------------|
| <b>Individual characteristics</b>                                                |                           |                              |
| Age                                                                              | 55.54                     | 257.94**                     |
| Age squared                                                                      | −0.52                     | −2.59**                      |
| High school                                                                      | −5.82                     | 170.68                       |
| University                                                                       | 66.79                     | 366.37                       |
| Log income                                                                       | 871.54***                 | 1809.95***                   |
| Financial decision-maker                                                         | −533.53***                | −390.96*                     |
| Primary earner                                                                   | −364.26**                 | −155.28                      |
| <b>Household characteristics</b>                                                 |                           |                              |
| Married                                                                          | −84.82                    | 715.13**                     |
| South                                                                            | 449.28                    | 284.18                       |
| Big municipality                                                                 | −166.49                   | −578.72*                     |
| Small municipality                                                               | −106.41                   | −27.33                       |
| Household size                                                                   | −654.00                   | −1659.83***                  |
| Household size sq.                                                               | 68.45                     | 163.80**                     |
| Homeowner                                                                        | −171.44                   | −24.76                       |
| Business owner                                                                   | 31.39                     | −302.60                      |
| <b>Employment &amp; Industry</b>                                                 |                           |                              |
| Self-employed                                                                    | 813.85**                  | 736.22**                     |
| Agriculture                                                                      | −1234.39                  | −77.62                       |
| Industry                                                                         | −816.00                   | 276.86                       |
| Construction                                                                     | −1247.58                  | −454.15                      |
| Trade and Horeca                                                                 | −882.62                   | 399.17                       |
| Transport/Communic.                                                              | −1363.01                  | 120.75                       |
| Finance/Insurance                                                                | −1272.26                  | 13.83                        |
| Real estate/Services                                                             | −1281.98                  | 301.37                       |
| Private services                                                                 | −771.88                   | 10.14                        |
| Public adm./Health                                                               | −967.65                   | 339.13                       |
| Employer matching                                                                | −80.33                    | 176.67                       |
| <b>Wealth quintiles</b>                                                          | Yes                       | Yes                          |
| <b>Income quintiles</b>                                                          | Yes                       | Yes                          |
| <b><math>\rho = 0.493 (0.073)</math></b>                                         |                           |                              |
| <b><math>H_0: \rho = 0</math> rejected (<math>z = 5.61, p &lt; 0.001</math>)</b> |                           |                              |
| <b>Observations: 830</b>                                                         |                           |                              |

*Notes:* Bivariate Tobit (mixed-process regression), left-censored at zero, estimated jointly on the sub-sample of couples in which both partners participate. Coefficients in real euros at 2015 prices. Reference category for sector is “Other”. Wealth and income quintiles (relative to the first quintile) and survey wave dummies are included but not reported. Survey weights applied. Standard errors clustered at the household level. \* $p < 0.10$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$ .

## 6.1 Robustness

To assess robustness of the results obtained, we examine the stability of the within-couple correlation  $\rho$  along two dimensions: alternative subsamples that address competing explanations and an alternative functional form. All specifications retain the baseline individual and household controls, survey weights, and household-level clustering. Full results appear in Appendix B; here we summarize the behavior of  $\rho$ .

At the participation stage, the main concern is that the positive correlation may simply reflect shared occupational access. We therefore re-estimate the bivariate probit on couples where partners work in different sectors, minimizing spousal similarity in fund access, and we exclude public-sector workers with atypical enrollment rules. We also re-estimate the model on couples in which partners have different education levels, since education is one of the main dimensions within which assortative mating occurs (Kalmijn, 1998). In all three subsamples the correlation remains positive, large, and highly significant ( $\rho$  between 0.57 and 0.68), and it is virtually unchanged when we re-estimate the model as a linear probability SUR ( $\rho = 0.38$ , with the expected attenuation when moving from the latent to the linear-residual correlation). The coordination pattern is therefore not driven by shared sectoral access or by the probit functional form.

The same logic applies to contributions. Re-estimating the bivariate Tobit by sector, education, and for couples with an above-median age gap (to rule out similar retirement horizons) keeps the correlation positive and significant throughout ( $\rho$  between 0.35 and 0.57). Using a seemingly unrelated regression on log contributions instead of the censored model yields a similar, slightly higher correlation ( $\rho = 0.64$ ), showing that residual dependence between partners' contributions does not depend on the Tobit specification. Overall, within-couple correlation is stable across subsamples and functional forms at both margins.

## 7 Permanent and transitory intra-couple correlation

The positive within-couple correlation  $\rho$  at both margins in the pooled cross-section documented so far, may mix in a single parameter two forces: a stable couple-specific propensity and a period-specific alignment of decisions. Using the (unbalanced) panel structure, we now separate these two components by re-estimating the bivariate probit and Tobit with couple-level random effects. This econometric strategy follows the framework proposed by Alessie et al. (2004) and Miranda (2011) and allows us to split each

partner's error into a permanent component, constant across waves, and a transitory, wave-specific component; we estimate cross-partner correlations for each.

The permanent correlation,  $\rho_u$ , is the correlation between partners' couple-level random effects and reflects stable coordination that persists across waves. The transitory correlation,  $\rho_\varepsilon$ , is the correlation between partners' wave-specific errors and reflects contemporaneous alignment net of that stable propensity. A positive  $\rho_u$  indicates structural co-movement; a positive  $\rho_\varepsilon$  indicates active, period-by-period coordination. Jointly, these parameters refine the interpretation of the results of Section 6: co-movement only in  $\rho_u$  is consistent with persistent unobserved heterogeneity or assortative mating, whereas a positive  $\rho_\varepsilon$  is difficult to explain by assortative mating alone and points to within-couple coordination.

The panel is unbalanced: many couples are observed in a single wave, and the permanent component is identified only from those observed repeatedly. This subset is sizeable for participation but small for contributions, where  $\rho_u$  is correspondingly less precisely estimated.

Table 6 reports the two cross-partner correlations from the random-effects bivariate probit for participation: the permanent correlation  $\rho_u$  and the transitory correlation  $\rho_\varepsilon$ . The full coefficient vector mirrors the cross-sectional probit (Equation 1) of Section 6 and is omitted for brevity; it is available upon request.

**Table 6. Decomposition of the intra-couple correlation in participation (RE bivariate probit)**

| Component                     | $\rho$   | Std. err. | 95% CI         |
|-------------------------------|----------|-----------|----------------|
| Permanent $\rho_u$            | 0.652*** | 0.035     | [0.583, 0.721] |
| Transitory $\rho_\varepsilon$ | 0.643*** | 0.040     | [0.564, 0.722] |

*Notes:* Cross-partner correlations from a random-effects bivariate probit (9,926 couple-year observations). Point estimates obtained as tanh of the estimated atanh-parameters (delta-method standard errors). Individual and household controls, survey-year effects, and survey weights included. Standard errors clustered at the household level. \*\*\* $p < 0.01$ .

Both components of the intra-couple correlation in participation are positive, large, and strongly significant: the permanent correlation is  $\rho_u = 0.652$  (standard error 0.035) and the transitory correlation  $\rho_\varepsilon = 0.643$  (0.040), with independence rejected in both cases ( $p < 0.001$ ). The coordination documented at the extensive margin is therefore present in both parts of the error structure and, HP1 (the atomistic model) and HP2 (the unitary model with fiscal optimization) are rejected, while HP3 (the cooperative model with limited commitment) is supported by the data.

The two components are almost identical in size. One reflects a stable propensity shared by the couple, consistent with persistent unobserved heterogeneity or assortative mating. The other is transitory,

aligning partners' decisions within each wave beyond that stable propensity. This second component is harder to attribute to assortative mating and instead suggests active coordination within the couple, though wave-specific shocks common to both partners may also play a role.

Table 7 reports the two cross-partner correlations from the random-effects bivariate Tobit for contributions: the permanent correlation  $\rho_u$  and the transitory correlation  $\rho_\varepsilon$ . As before, results with the full coefficient vector mirror the cross-sectional Tobit (Equation 2) in Section 6 and are omitted for brevity (full results available upon request).

**Table 7. Decomposition of the intra-couple correlation in contribution (RE bivariate Tobit)**

| Component                     | $\rho$   | Std. err. | 95% CI       |
|-------------------------------|----------|-----------|--------------|
| Permanent $\rho_u$            | 0.292**  | 0.117     | [0.05, 0.50] |
| Transitory $\rho_\varepsilon$ | 0.793*** | 0.119     | [0.42, 0.94] |

*Notes:* Cross-partner correlations from a random-effects bivariate Tobit estimated on the sub-sample of couples in which both partners participate (830 couple-year observations). Point estimates obtained as tanh of the estimated atanh-parameters (delta-method standard errors). Individual and household controls, survey-year effects, and survey weights included. Standard errors clustered at the household level. \*\* $p < 0.05$ , \*\*\* $p < 0.01$ .

Both components of the intra-couple correlation are positive and significant: the permanent correlation is  $\rho_u = 0.292$  (standard error 0.117) and the transitory correlation  $\rho_\varepsilon = 0.793$  (0.119). As at the extensive margin, results support HP3 (the cooperative model with divorce risk).

Unlike participation, however, the two components differ: co-movement in contribution amounts is concentrated in the transitory component, which seems to exceed the permanent component. This pattern shows that partners' contributions move together within each wave, consistent with common shocks to household resources (e.g., a wage raise, inheritance, job loss) affecting both accounts in the same period. Such behavior contradicts the unitary model's tax-maximization logic, which predicts that extra saving should be concentrated in the higher earner's account. The evidence therefore strengthens, on the intensive margin, the conclusion suggested in Section 6: within-couple coordination at the contribution margin is inconsistent with both the atomistic and the unitary-fiscal models, and consistent with cooperative models with limited commitment. We nonetheless interpret  $\rho_\varepsilon$  with caution, since it cannot separate active coordination from a common shock hitting both accounts; either interpretation, however, conflicts with the concentration implied by household tax optimization.

## 8 Conclusions

This study analyzes participation in and contributions to pension fund in Italy from an intra-couple perspective in order to assess what is the choice approach supported by the data, comparing three alternative decision models: the atomistic, the unitary with fiscal optimization, and the cooperative with limited commitment. Based on seven waves of the Bank of Italy's SHIW survey (2008–2022) and a sample of 9,926 couples, main results are as follows.

The within-couple correlation is positive and robust at both margins (participation  $\hat{\rho} \approx 0.65$ ; contribution  $\hat{\rho} \approx 0.49$ ). Contributions are not concentrated on the higher-earning partner, contrary to what tax optimization would prescribe. Overall results allow to conclude on the underlying within couple decision model. The lack of correlation predicted by the atomistic model (HP1) is rejected ( $\rho \neq 0$ ); the concentration predicted by the unitary model with fiscal optimization (HP2) is rejected ( $\rho > 0$  and no concentration on the primary earner). The evidence is instead consistent with a cooperative model with limited commitment that provides a natural rationalization of accumulation in individual accounts (HP3).

Using the survey's panel structure, we decompose the correlation into a permanent component, shared by the couple across waves, and a transitory wave-specific component. For participation, these two components are similar in size, so coordination reflects both a stable couple trait and contemporaneous alignment. For contributions, co-movement is concentrated in the transitory component: partners' contributions move together mainly within each wave, consistent with common shocks to household resources affecting both accounts and, again, inconsistent with a concentration of contributions on the higher earner, as implied by tax optimization. Because co-movement is not confined to a stable trait, a purely selective explanation, such as assortative mating, is unlikely, pointing instead to within-couple coordination and again rejecting the atomistic and the unitary models (HP1 and HP2) and supporting a cooperative model with limited commitment (HP3). Within the cooperative family, the negative association between the wife's economic strength and contributions to her account points towards a protective allocation motive, although our evidence remains associative and cannot rule out other cooperative mechanisms

In sum, when couples decide over pension fund participation and contribution, our analyses on SHIW data, which are robust to various checks, reject the atomistic and the unitary decision model, supporting instead cooperative models with limited commitment, with two relevant implications. For research, modeling pension choices as individual decisions misses systematic intra-couple dependence at both margins that, as the decomposition shows, operates period by period. The couple is therefore the appropriate unit of analysis. For policy, couples' failure to concentrate contributions on the higher earner means the tax

deductibility of contributions is largely unused, and its design could be reconsidered in the light of how couples actually save, consistently with evidence from other pension systems (e.g., Choukhmane et al., 2025; Yang et al., 2025; Austen et al., 2026). At the same time, the protective allocation pattern suggests that the individual nature of pension fund positions may serve an important function in reducing within-couple financial vulnerability, especially for women with weaker first-pillar coverage — a consideration that should inform the design of incentive structures.

The analysis has some limitations. The evidence is associative:  $\rho$  measures a residual correlation, not an identified directional effect, and no plausible instrument would satisfy the exclusion restriction in a context of coordinated choices. The transitory correlation captures contemporaneous co-movement but cannot separate active coordination from shocks common to both partners within a wave; the permanent component, in turn, is identified only from couples observed in multiple waves, limited, especially for contributions, given the unbalanced panel. Finally, neither the divorce-risk nor the protective-allocation mechanism is directly tested: the coefficient pattern is suggestive but does not identify the structural channel. The discrimination between cooperative sub-models, and the role of first-pillar generosity in shaping supplementary pension choices within the couple, are left for future research.

## A. Variables

All variables are derived from the Bank of Italy's Survey on Household Income and Wealth (SHIW). Monetary amounts are expressed in real terms at 2015 prices, deflated by the consumption deflator provided with the survey.

**Age, Age squared:** Age in years and its square.

**Big municipality:** Dummy equal to 1 if the municipality of residence has more than 200,000 inhabitants. Reference: medium-sized municipalities.

**Business owner:** Dummy equal to 1 if the household owns shares in a private family business.

**Contribution:** Annual amount paid by the individual into their pension fund, in real euros at 2015 prices ( $\text{cont}_h$ ,  $\text{cont}_w$ ).

**Employer matching:** Dummy equal to 1 if the individual's pension fund benefits from an employer matching contribution.

**Financial decision-maker:** Dummy equal to 1 if the individual is the self-declared person responsible for the household's financial and economic choices.

**High school:** Dummy equal to 1 if the highest qualification attained is an upper-secondary diploma. Reference category: lower education.

**Homeowner:** Dummy equal to 1 if the household owns its primary residence.

**Household size, Household size squared:** Number of household members and its square.

**Log income:** Natural logarithm of individual net disposable income excluding financial income, at constant 2015 prices.

**Married:** Dummy equal to 1 if the two partners are legally married.

**Pension-fund participation:** Indicator equal to 1 if the individual owns a pension fund. Defined separately for the husband ( $\text{pf}_h$ ) and the wife ( $\text{pf}_w$ ).

**Primary earner:** Dummy equal to 1 if the individual is the household's largest income earner.

**Sector of activity:** Ten-category classification of the sector of economic activity: agriculture, industry, construction, trade and hospitality (Horeca), transport and communications, finance and insurance, real

estate and business services, private services, public administration and health, and a residual “Other” category that serves as the reference group.

**Self-employed:** Dummy equal to 1 if the individual is a self-employed worker. Reference: dependent employee.

**Small municipality:** Dummy equal to 1 if the municipality of residence has fewer than 20,000 inhabitants. Reference: medium-sized municipalities.

**South:** Dummy equal to 1 if the household resides in the South or Islands.

**University:** Dummy equal to 1 if the highest qualification attained is a university degree or postgraduate qualification. Reference category: lower education.

**Wealth quintile, Income quintile:** Five-category classifications of household net wealth and of household income, entered as dummies.

**Year fixed effects:** Dummies for the survey years 2008–2022.

## B. Robustness

This appendix presents the results of a series of robustness checks conducted on the conditional correlation between partners' decisions at the extensive margin of participation (Table B1) and at the intensive margin of contribution (Table B2). The full regression tables are omitted for brevity and are available upon request.

**Table B1. Robustness of the within-couple correlation: participation**

| Specification                   | $\hat{\rho}$ | Sig. | N     |
|---------------------------------|--------------|------|-------|
| Baseline (bivariate probit)     | 0.647        | ***  | 9,926 |
| <i>Alternative subsamples</i>   |              |      |       |
| Different sectors               | 0.572        | ***  | 6,331 |
| Different education levels      | 0.618        | ***  | 4,475 |
| Excluding public-sector workers | 0.678        | ***  | 5,367 |
| <i>Alternative model</i>        |              |      |       |
| Linear probability SUR          | 0.378        | ***  | 9,926 |

Notes: Each row reports the estimated within-couple correlation  $\hat{\rho}$  from a separate estimation, with the full set of individual and household controls, survey weights, and standard errors clustered at the household level. \*\*\*  $p < 0.01$ .

**Table B2. Robustness of the within-couple correlation: contributions**

| Specification                 | $\hat{\rho}$ | Sig. | N   |
|-------------------------------|--------------|------|-----|
| Baseline (bivariate Tobit)    | 0.493        | ***  | 830 |
| <i>Alternative subsamples</i> |              |      |     |
| Different sectors             | 0.351        | ***  | 522 |
| Different education levels    | 0.550        | ***  | 398 |
| Above-median age gap          | 0.572        | ***  | 467 |
| <i>Alternative model</i>      |              |      |     |
| SUR on log contributions      | 0.650        | ***  | 762 |

Notes: Each row reports the estimated within-couple correlation  $\hat{\rho}$  from a separate estimation, with the full set of individual and household controls, employer matching, survey weights, and standard errors clustered at the household level. \*\*\*  $p < 0.01$ . The SUR on log contributions drops the left-censoring at zero and is estimated on couples with positive contributions for both partners.

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