TAX ADVANTAGE VS. CONTRIBUTION MATCHING IN TURKEY

WHO BENEFITS FROM THE POLICY CHANGE IN INDIVIDUAL PENSION SYSTEM?

BY

MELISA SAYLI

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Department of Economics
Koc University, Istanbul

THESIS COMMITTEE:

Dr. Sule Alan, Koc University
Prof. Thomas Crossley, Koc University
Dr. Ali Coskun, Bogazici University

LOCATION:

Istanbul

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ABSTRACT

Turkish government changed the financial incentive mechanism of the individual pension system (IPS) to boost domestic savings and to increase pensioner base. Previously introduced tax-advantage was poorly utilized and benefited mostly the highest income groups who are subject to a higher marginal tax rate. Coming into effect as of January 1, 2013, the nationwide incentive shift to government matching contributions in the IPS targets low income groups and those who were not eligible to benefit from tax-advantage.

This research approaches the private pension systems from household's perspective by using an administrative panel data set on individually held pension contracts. We examine the composition of new entrants to the system and whether the incumbent participants respond the incentive shift by changing their contribution amount. Our results show that the composition of new participants to the IPS differs from the incumbents' in several ways. In the first quarter of 2013, older groups and middle income earners enter the system at an increasing rate, whereas the percentage of high income groups within the new participants drops significantly by 5 percentage points when compared to the same period of previous year. The policy shift is successful in attracting retirees and housewives who are mostly non-tax-payers (and were not eligible for the tax-advantage). We find that the policy's implementation does not have any impact on the amount of discretionary changes in contribution levels across different income groups, whereas the participants from different educational backgrounds responds the policy change with varying amounts.

Keywords: Private pension system, government matching, financial incentives, composition of participants, contribution levels

ÖZET

Türk hükümeti, yurtiçi tasarrufları ve emekli tabanını arttırmak amacıyla bireysel emeklilik sisteminin (BES) finansal teşvik mekanizmasını değiştirmiştir. Önceden uygulanan vergi avantajı kötü kullanılmış ve yalnızca daha yüksek marjinal vergi oranlarına tabi olan en yüksek gelirli kesime yarar sağlamıştır. BES'te yurt genelinde 1 Ocak 2013 itibariyle yürürlüğe giren hükümet katkı payına geçiş değişikliğinin, düşük gelirli ve vergi avantajından faydalanmaya uygun olmayan kesime fayda sağlayacağı düşünülmektedir.

Bu araştırma, bireysel emeklilik sözleşmelerini içeren idari panel veri seti kullanarak bireysel emeklilik sistemini hane halkı perspektifinden ele almaktadır. Sisteme yeni girenlerin bileşimini ve hali hazırda sistemde olan katılımcıların teşvik değişimine katkı paylarını değiştirerek cevap verip vermediklerini incelemekteyiz. Sonuçlarımız, yeni BES katılımcılarının bileşiminin, hali hazırda sistemde olanlarınkinden farklı olduğunu göstermektedir. 2013'ün ilk çeyreğinde, daha yaşlı gruplar ve orta gelirliler gittikçe artan bir oranda sisteme katılırken, yeni katılımcıların içindeki yüksek gelirli grup yüzdesi bir önceki yıla oranla %5 puanlık bir düşüş göstermiştir. Teşvik değişimi, çoğunlukla vergi ödemeyen (vergi avantajından yararlanmak için uygun olmayan) emeklilerin ve ev kadınlarının dikkatini çekmekte başarılı olmuştur. Teşvik değişiminin yürürlüğe girmesinin, farklı gelir grupları arasında katkı seviyelerinde isteğe bağlı değişikliklerin miktarına herhangi bir etkisi bulunmadığı, ancak farklı eğitim seviyelerinden katılımcıların değişikliğe farklı oranlarda yanıt verdiği görülmüştür.

Anahtar Sözcükler: Bireysel emeklilik sistemi, devlet katkısı, finansal teşvik, katılımcıların bileşimi, katkı payı seviyeleri

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INTRODUCTION

The private pension systems are not only important to increase domestic savings for macroeconomic stability but also to ensure that households get adequate levels of income during retirement. According to World Bank's report in 2011[1], the decline in savings in the last decade was driven by the fall in household savings. Traditionally, Turkish people hold their savings in bank deposits and the financial instruments available to households are relatively limited, leaving a considerable amount of saving under the mattress.

The Individual Pension System[2] (IPS) in Turkey is a voluntary defined contribution system that provides long-term funds to economy, and supplements the pay-as-you-go (PAYG) public pension by channeling household savings into investment.[3] Aviva's report on pension gap across Europe claims that an individual who retires between 2011 and 2051 in Turkey should additionally save 500 TL per month to cover pension gap[4]. Thus in micro level, the system plays an important role in maintaining people's standard of living during retirement and to cover pension gap as individuals take responsibility to save for their future. Yet, the funds accumulated in the IPS makes only 2% of Turkish GDP, whereas the OECD average is 72.4%.

To motivate people to save in pension funds, private or public, governments use several financial incentive mechanisms, taking the form of either

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1 "Sustaining High Growth: The ole of Domestic Savings, *Turkey Country Economic Memorandum.* (2011) Report No.66301-TR, World Bank and Republic of Turkey Ministry of Development
2 Throughout this thesis, "individual pension system" and "private pension system" are used interchangeably.
3 According to Financial Stability Report, November 2012 by Central Bank of Republic of Turkey, bank deposit's share among households' financial assets is around 70%. Despite the increasing share of private pension funds in houseboulds' asset balance, its share is still small, being around 3% in September 2012.
4 Aviva is the market leader in general insurance, life and pension in the UK, operating in 17 countries across the world.

a tax-advantage, or matching contributions, or in some cases both [5]. The world experience presents ambiguous empirical evidence on the incentives' effectiveness of creating new saving and reaching to its targeted groups. As it will be discussed in the next section, the most well-known examples of tax-favored pension accounts in the world are the Individual Retirement Accounts (IRAs) of the US, 1999 Stakeholder Pension of the UK, and Registered Retirement Savings Plans (RRSPs) in Canada. To broaden the pension coverage, most countries implement matching contribution either by government or employer such as 401(k)-plans in the US, Kiwi Saver in New Zealand, and Riester Plan in Germany. These pension plans coexists with other retirement saving plans that are complementing the PAYG. What is novel in Turkish experience is that the incentive shift from tax advantage to government matching in the IPS, the only alternative of social pension provision, is nationwide in its nature, thus the only eligibility criteria is to contribute to the IPS and being above 18.

For almost a decade, the incentive mechanism to encourage participation in IPS in Turkey was based on tax advantage. Contributions were tax-deductible up to 10%[6] of income with a cap of annual minimum wage. The Pension Monitoring Center's (PMC) survey on tax-incentive awareness and utilization reveals that only 35% of all participants are using the tax-advantage. To encourage households to save and to broaden the pensioner's base, existing private pension system was revised in June 2012. Coming into force as of January 1, 2013, Turkish government replaced the system of tax advantage with government matching contribution. Participants receive government match with a rate of 25% for each paid monthly contribution up to a limit of 25% of annual minimum wage. It is expected that the new incentive will expand the private pension coverage because unlike the previous tax-favored pension system, every Turkish citizen above the age of 18 can benefit from the policy regardless of being a tax-payer. Therefore this all-encompassing aspect of the new incentive scheme aims to incorporate the lower income groups as well as the individuals engaged in informal sector

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5 It is also important to note that these two incentive mechanism are most widely used. Auto-enrollment can also be counted as an incentive mechanism to encourage people to save more in retirement accounts, but so far it is only implemented in limited number of countries, thus not included.

6 This rate was increased to 15% in 2012.

to the IPS.

This study examines the policy shift's effect on the composition of new participants of the IPS in the first quarter of 2013, and on the incumbent participants response to government matching on their contribution levels. By employing administrative panel data from a private provider, our results show that the composition of new participants to the IPS differ from the incumbents' in several ways[7]. In the first quarter of 2013, older groups and middle income earners enter the system at an increasing rate, whereas the percentage of high income groups within the new participants drops significantly by 5 percentage points when compared to the same period of previous year. The policy shift is successful in attracting retirees and housewives who are mostly non-tax-payers. We find that the policy's implementation does not have any impact on contribution levels across different income groups, whereas the response from different educational background varies, where the highest response comes from primary school graduates. The literature on private pensions and incentive mechanisms is concentrated on the financial performance of the saving product, on the "new-saving-creation" of incentivized pension plans, and on the impact of the incentive mechanisms on the participation, participation probability and contribution to pension plans. This study contributes to the latter part of the literature by investigating the composition effect of a large-scale policy shift from tax-advantage to government matching contributions in the private pension system. To the best of my knowledge, there has been no other study examining the impact of such a nation-wide policy change on participant's composition and the response on contribution levels, especially in Turkey.

The study proceeds by providing a brief literature review on private pensions. Section 3 gives the background information on the Turkish Individual Pension System and explains the policy shift in detail. Data overview and methodology followed in this study is introduced in Section 4. Section 5 presents the results and Section 6 summarizes the research and concludes.

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7 Due to confidentiality agreement, we do not reveal the name of the data provider and thereon it will be referred as "the provider".

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LITERATURE REVIEW

The effectiveness of financial incentives for pension system is a long-running debate in the field of economics. While the pension funds' performance and the asset composition of pension products, such as pension mutual funds, are examined mostly by scholars of finance, economists concentrate on two issues regarding the financial incentives on pension systems: one is the contentious debate of "new" saving creation through retirement savings to sustain macroeconomic stability, and the other is the impact of these incentives on coverage, participation probability and contribution levels to the private pension systems for attain adequate saving during retirement.

From the macroeconomic point of view, the economic theory is ambiguous on the impact on financial incentives to increase household saving. The saving accumulated in the incentives pension system may be a result of transfers from other assets, meaning that the saving would have occurred otherwise but would have been held in other accounts or genuinely new saving as a result of the financial incentive (Crossley et al., 2012).Thus new saving depends on the offsetting of the two opposing effects, namely substitution and income effects.

The literature on effectiveness of financial incentives and pension plans on savings concerns much of the US experience of Individual Retirement Accounts (IRAs) and 401(k) plans. In line with the economic theory, empirical findings range from large and significant impact of the incentives on savings to little effectiveness. For instance, Venti and Wise (1990) and Poterba et al. (1996) find large and significant effect of tax-favored pension accounts, whereas Engen et al. (1994) claim that IRAs and 401(k) plans do not stimulate private saving and have very little effect on increasing national savings.

On the other hand, Chernozhukov and Hansen (2004)(on the US) and Attanasio et al. (2004) (on the US and UK) report that there is little or no

net effect of financial incentives in creating new savings, but the reshuffling of assets among the wealthiest in the society. Empirical evidence on the responsiveness of income groups to incentives are presented by Iyengar et al. (2004),Antolin et al. (2004) (tax-advantage) and Harvey et al. (2007)(matching contributions). While the former shows that low and middle income groups are more inclined to create new saving, the latter asserts that substitution effect offsets the income effect among high income households. Ayuso et al. (2007) shows in their study on the effectiveness of tax-advantage on retirement savings of different population groups in Spain that the tax incentive on consumption and saving of different population groups. They report that new saving creation is limited, older and high income cohorts tend to shuffle their portfolios to exhaust the limits of tax-advantage. An important point underlined by Emmerson and Wakefield (2003) and Attanasio et al. (2004) is that even though the incentives mostly target a specific group (low or middle income earners) the availability of incentives to higher income households results in switches in portfolios of higher income groups. These shifts of assets to benefit from tax-treatment or matching contributions do not create any real changes in economic behavior.

Another aspect of incentivized pension plans concerns the adequacy of households' retirement saving. Most of the research in this line assess the impact of incentives on the probability of participation and level of contribution. The most prominent experimental evidence on the effect matching contributions on participation and contribution level is is presented by Duflo et al. (2006). Their randomized field experiment shows that presence of matching increase take-up rates and contribution levels, whereas providing information and counseling on pension plans also affect saving decisions of households[1].

Saez (2009) contends that offering an economically equivalent subsidy as match rather than tax credit raises participation in pension plans in the US. Disney et al. (2008) presents a strong evidence that individuals respond to financial incentives and participates pension plans in the UK. Bassett et al. (1998) and Choi et al. (2004) assert that there is a positive correlation between

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[1] The importance of information and framing is also important factors for housholds' saving decisions as also suggested by Saez (2009).

employer match and 401(k) participation in the US. Choi et al. (2004) show that the introduction of employer matching if there were no matching before decreases the contribution rates of the participants [2]. The findings of Cunningham and Engelhardt (2002) suggest the limit on the tax deductability of IRAs increased the savings on 401(k)'s, matching has little impact on saving in these plans and pension coverage with any other plans reduces the 401(k) saving. Papke (1995): claims that the participation rates to 401(k)-plans are sensitive to the presence and the level of employer matching.

The literature concerning the Turkish private pension system is limited compared to the research on developed countries' experience. Cihan and Ozel (2013) assess the impact of private pension system on domestic savings using panel data of countries which have similar income level and economic structure to Turkey. Their findings indicate that changes in incentive mechanisms increases domestic savings with a lag. By scenario analysis, they also compare the effectiveness of tax-advantage and of newly introduced government matching on participation. Unlike the findings of Engen and Gale (2000), they assert that the low income groups did not benefit from the tax-favored pension plans but from matching contributions[3]. Other researchers (Isik et al. (2011);Can (2010)) focus on the structure of the IPS in Turkey.

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2 Thus for those employees who were already contributing in 401(k) plans, matching causes income effect.

3 Yet, their analysis also indicates that the participation from low income groups will be limited because of high operational fees which stand as critical parameters in their research.

INDIVIDUAL PENSION SYSTEM IN TURKEY AND THE POLICY CHANGE

The mutli-pillar structure of pension systems is classified by the OECD (2005). The publicly provided pension schemes with defined benefits[1] and PAYG finance, usually based on payroll tax constitutes the first pillar of the multi-pillar structure. The aim is to establish social justice by providing minimum pension during retirement. The second pillar is privately managed pension schemes which are provided as a part of occupational plan. Private pension plans functioning on voluntary basis with defined contributions constitutes the third pillar. These private pension plans are administered by pension companies, and the participant of the system engages in a "legally binding contract having an explicit retirement objective and the benefits can not be paid at all or without significant penalty unless the beneficiary is older than a legally defined retirement age"(OECD 2005). The third pillar aims to reduce the fiscal burden on the state budget, to deepen the capital markets by supplying new products, and to increase the scope of social security by providing a long-term saving vehicle to retain an adequate level of retirement income.

The third pillar of pension system in Turkey is consolidated by the law for Individual Pension Savings and Investment System Law which is published in Official Gazette No: 24366 in April 2001, and came into effect six months later. However it was not until October 27, 2003 that the pension companies started to offer pension products and ,by that officially launching the IPS in Turkey. The system, as stated above, functions on the basis of voluntary participation within a fully funded defined contribution scheme, where the contributions are invested in "pension mutual funds". To qualify for retirement from the IPS in Turkey, participant must contribute to the system for at least 10 years and reach the age of 56; withdrawals before 10

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[1] Traditional defined benefit systems works as the benefits are linked through a formula to the members' wages or salaries, length of employment.

years and/or the legally defined retirement age are subject to penalties. The system is regulated and supervised by Undersecretariat of Treasury, PMC, and the Capital Markets Board. One year after the establishment of the IPS in Turkey, the number of participants and the amount of funds collected in 2004 was 314 thousand people and 276 million TL, respectively. By the end of 2012, the number of participants rose to 3.1 million and the amount accumulated was 20.3 billion TL. The IPS is a growing sector, yet only 4.2% of the working age population is covered by voluntary personal pension plans[2].

For a decade, the incentive mechanism to encourage people to save in pension plans was the tax-advantage from contributions which were deduced from the tax base up to the amount of annual minimum wage.[3] The tax-treatment is characterized as an *exempt-exempt-taxed* scheme, where the tax-advantage is provided in three stages in the IPS.[4] The first stage of tax-advantage prevails when the contributions are paid. If the participant is a tax-payer, then the contribution is tax-deductible up to 10% of the gross wage with a cap of minimum wage of that year. During the investment period, the second stage of tax-advantage, there is no withholding tax on earnings of the mutual pension funds. In the last stage, if the participant is qualified to retire from the IPS, the income received from the pension system is considered as capital gain, thus is liable for withholding tax. In this case the retiree receives 25% of the benefits as tax-exempt, and the rest of 75% of savings is subject to withholding tax at a rate of 5%[5]. However if the participant has paid contributions for at least 10 years but does not satisfy the age-condition at the time of withdrawal, the benefits are subject to 10% withholding. If the participant leaves the system before completing 10 years, then the benefits are subject to 15% withholding tax.

According to PMS' participant satisfaction survey conducted in 2007, only 8% of the participants entered the system because of the tax-advantage the

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2 Source: OECD Global Pension Statistics, and OECD calculations using survey data in 2010.
3 The rules and regulations on the taxation to IPS were set out in Law no. 4697, in which the provisions regarding the practices about the tax-incentive granted for the IPS is covered. The Law also amends some articles of the Income Tax Law, Corporate Tax Law, Stamp Duty Law and the Law on Banking and Insurance and Insurance Transactions Tax.
4 Since this thesis concerns with individually hold contracts in the IPS, withholding tax rates and tax-exemptions on employee contracts are omitted.
5 Same rates are valid for those who leaves the system because of disability or death.

IPS provides. More than half of the participants aim to contribute to the system is to make extra savings and 43% stated that they save for retirement (Eme). 2010 survey on the assessment and comparison in the tax-advantage usage reported by PMS reveals that the tax-incentive utilization varies across participants depending on their labor market status. By the nature of the tax incentive system only those who are tax-payers can benefit from the system. In 2010, 60% of those who declared themselves to be wage-earners registered to tax-system utilized the incentive, whereas only 34% of self-employed made use of the incentive (IPS PR 2010). A more recent survey on tax-incentive awareness and utilization carried by the PMS shows that only 35% of the IPS' participants are using the tax-advantage. When it is asked why they are not utilizing the tax-advantage, more than half responded that they are "not interested in, or not relevant to or oblivious to the amount", 11% stated that they are "not aware" whereas another 11% is "not eligible" for the tax-incentive (Eme, 2012).

Emmerson and Wakefield (2003), Antolin et al. (2004) and Cihan and Ozel (2013) suggest, one of the disadvantages of tax-incentive on pension funds is that the financial incentive is strongest for the high income groups. Also considering the large informal segment of Turkish labor market, in order to boost savings and to broaden pension coverage through the IPS, Turkish government revised the incentive mechanism and transit from tax-incentive to contribution matching which is a more encompassing policy in the sense that every participant of the IPS above the age of 18 can benefit from the incentive mechanism regardless of being a tax-payer. The policy makers aim to incorporate the lower income segments of population, as well as the individuals who works in the informal sector, to the IPS.

On July 29, 2012 Turkish government announced that the Law on Individual Pension Savings was amended.[6] The most significant feature of this amendment is the shift in incentive structure of the IPS. Previously existing tax-incentive is replaced with government matching contribution, taking into

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6 Along with amendments in the "Law on Amendments to Individual Pension Savings and Investment System Law, and to Certain Laws and Decrees" on certain provisions of Income Tax Law No: 193 and Investment System Law No. 4632. Source: Individual Pension System Progress Report 2012 by Pension Monitoring Center published on May 16,2013. One can freely download the report from www.egm.org.tr/bes2012gr.htm.

effect as of January 1, 2013. According to the policy change, for each monthly contribution paid, participants are matched by the government with a rate of 25% up to a limit of 25% of the annual minimum wage, which is 3,000.15 TL[7] for 2013. Government match is deposited in Takasbank under the name of the contributer in three months following the contribution payment by the participant[8] and this benefit is also invested in portfolios determined by the Undersecretariat of Treasury. Besides the government match, with this policy change the withholding tax is only imposed on the amount of the revenue. Accordingly, if a participant has been paying contributions for at least 10 years and satisfies the age requirement, the participant receives 100% of the government match and its benefits and subject to a withholding tax at a rate of 5%; however if the age requirement is not satisfied then the participant can only collect 60% of the match and withholding tax rate becomes 10%. If the participant remains in the system for at least 6 years, he receives 35% of the match whereas staying at least 3 years in the system allows the participant to claim only 15% of the government match and its benefit and the tax withheld at a rate of 15%.[9] This multi-stage match claim is constructed to encourage participants to stay longer in the IPS, whether this will be achieved is to observed in coming years.

At the press conference on government matching contributions in early January 2013, Ali Babacan, Deputy Prime Minister responsible for Economy, announced that the resource allocated to the government match from the 2013 Budget accounts 1 billion 250 million TL. It is also noted that government expects that the policy change attracts 500 thousand people to the system and the accumulated funds to reach 30 billion TL. PMC surveyed pension companies' targets and sectoral expectations for 2013, and the results indicate that according to the most probable scenario, the arithmetic mean of expected new participants to the system is 1 million and the cumulative amount of accumulations at the year-end is expected to be 27 billion TL (Eme, 2013). It is noted that the incentive is well advertised and dissem-

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7 The gross annual minimum wage in 2013 is 12,000.6 TL. Then the maximum amount of government match for a participant eligible for the incentive is $12,000.6 \times 0.25 = 3.000,15$TL.

8 The first match by the government is deposited on April 30, 2013 to individuals' accounts in Takasbank. There has been a lag in match payment if the contribution is paid by credit card due to institutional documentation.

9 Since this thesis is concerned with individual contracts held in the IPS, amendments on employee contributions, rate and reductions in fees and operational costs are omitted.

inated through TV advertorials, billboards and its comprehensible nature would attract more participants than the tax-incentive achieved.

After six months of the implementation of government matching contribution in the IPS, the number of participants increased from 3.12 million to 3.68 million, whereas the accumulated pension fund amount increased by 2 billion TL.[10]

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10 The numbers are available at PMC's website, egm.org.tr, under the Main Indicator's of IPS. The data range selected is 31.12.2013 and 28.06.2013.

4

DATA AND METHODOLOGY

4.1 DATA OVERVIEW

This section presents the basic features of the data. The data consists of *individual pension contracts*[1], meaning that participants entered the system personally[2]. By the end of March 2013, 87% of pension contracts are individually held, whereas the sectoral percentage is 74. As discussed in Section 3 the new incentive scheme, government matching contributions, applies for those participants who are either 18 or older and contributes monthly to the system[3]. Therefore the sample does not include participants who are not eligible for the government match, in other words under 18. The payment period of the contracts in the sample is *monthly*, thus the time variable for sample panel data is set by month spanning from *December 2005 to March 2013* with no lags in time. Panel variable is set by *contract* instead of participant, because a participant can hold more than one contract and this causes complications in data. In our random sample, every contract is held by one participants and therefore each contract-month uniquely identifies an observation.

By its panel nature, this data set is well suited for my objectives, namely how the composition of new entrants in the first quarter of 2013 differs from already existent participants and how they respond to this policy change. There is 46,888 contracts in the sample and 88 periods. This section provides descriptive statistics on participants, contracts and monthly contributions.

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1 Individual pension contracts (IPCs) are simply referred as "contracts" in this thesis. Other than IPCs, pension companies also offers "group individual contracts" and "noncontributory group contracts".
2 Around half million contracts we work with a 10 percent sample of contracts obtained from the provider.
3 For instance, if a participant made his contribution for 2013 annually in December 2013, he can not claim for match for his contribution for 2013 in the future.

A comparison between our sample and the aggregate sectoral descriptive statistics manifests the representativeness of our data obtained from a single company.[4] Table 4 shows these statistics, and except the average age and entrance age, participants' and contracts' characteristics comply each other. The average age of participants in our data is slightly higher than the sectoral average. This is mainly because of sample restrictions as discussed above.[5] As Table 4 depicts distribution of active participants according to their age categories, and to regions are akin to each other. Figure 6 illustrates the distribution of contracts in force and terminated by the end of 2012. It is important to note that our provider is one of the biggest companies in private pension sector and does not have any target policies.

Participants

The sample mainly consists of male participants, only 27% of them are female. The overall average age of the sample data is 39, whereas the average entrance age is 37 which is the average age of population within the IPS by the end of 2012 (IPS PR 2012). The distribution of age categories of the sample is congruent with the sectoral one presented in PMC's web site. 37% of the contracts in the sample are held by participants aged between 25-34, the sectoral correspondence, by the end of March 2013, is 36%.[6] More than one third of the contracts are held by participants from Marmara Region whereas the least number of contracts are from Eastern Anatolia. Almost one third of the sample is self-employer, and 7% of the sample is not in labor force. These numbers are expected to increase since these groups were previously not eligible to the tax-incentive, but they are in government matching.

Throughout this research two characteristics of the participants are emphasized. These are the time-invariant income and education of participants, collected at the time of entry to the system and only be updated if the partic-

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4 Aggregate sectoral data can be found in PMC's website under the main IPS indicators directory and also Individual Pension System Progress Report 2012, which is also available at PMC'S website.

5 Our sample only includes those contracts whose holder is 18 or above, this increases the average age of participants.

6 Source: Calculated from the sectoral data of end week of March 2013, found at http://web2.egm.org.tr/webegm2/chart/besgosterge/wg_dataview_tablolu.asp?raportip=1

ipants wish to do so.[7] The distribution of the education in Table 2 indicates that 52% of the participants have at least higher education.[8] Table 3 shows the distribution of self-declared income of participants. Around 30% of the participants are middle income earners whereas 22% of the participants did not provide their income information.[9]

Contracts

Two thirds of the contracts are still active while 27% opted-out and the rest of the contracts are either canceled or transferred to another firm. Almost one third of terminated contracts exit from the system one year after the contract's establishment. For those still active, average age of the contract is 2.4 years with a maximum of 7 years.[10] 27% of the contracts have a fund size of 1000-3000 TL, among those contracts one in three declared that they are low-income earners. Contracts exceeding the fund size of 50 thousand TL and still active make up less than 2% of the sample and held dominantly high income groups. Most widely used payment instrument for monthly contributions is credit card (70%), followed by direct debit.[11]

For most of the part of this research, active contracts are made use of. Active contracts, meaning that the contract is still in force at the end of data, make 66% of the contracts in the sample (30,970 contracts).

Monthly entry and exits are shown in Figure 7 and Figure 8. The first dashed reference line represents the month after the anouncement of the shift in the incentive mechanism in the IPS and corresponds to June2012, and the second reference line delineates the time of new policy's implementation, January 2013. Bearing in mind the differences in scales, both Figures 7 and

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7 Unfortunately the data does not provide any information whether they are updated.
8 Higher education is a combination of 2-year-degree programs and university degree. At least higher education means that master's and doctoral programs are also included.
9 Definition of income categories and distribution of income among participants is illustrated in Table 3 at Appendix,
10 The age of contract is a time-invariant variable defined as the year of last maturity of contribution minus the year of contract establishment. Since data dates back to Dec 2005, the oldest contract can be 7-year-old.
11 Participants of the system can also contribute by cash payments and transfers, but the percentage of these contributions are less than 1%.

8 illustrates that there is an increase in the number of contracts entered and exited the system during the anouncement period (period between two reference lines). Entries rocketed during the anouncement period, and then slowed down. The number of contracts exited the system steadily increase from July 2012 to December 2012 and reach a peak level in February 2013. The composition of newly entered contracts are examined in Section 4.2.1.

Monthly contribution amounts

The overall average of the monthly contribution amount is 150 TL, when the contract is conditioned on being an active contract the average contribution is 2 TL higher. The distribution of monthly contribution amounts is depicted in Figure 9. The distribution of contribution levels is skewed and as the long right tail shows there exists high contribution levels with very low density, standing as outliers. The summary statistics in Table 5 shows that the highest contribution amount in 99% quantile is 875TL, thus contracts within the top 1% of contribution levels in the sample could be omitted during estimations.

Table 6 and 7 present the mean contribution levels with respect to income and education groups. As expected high income group's contribution is higher than others. The average contribution level by lower income groups increase by 51 TL when the contribution is conditioned to be positive (contribution amount > 0). This suggests that lower income groups miss contribution payments more than any other income group. It is interesting that more educated participants contribute on average less to the system and misses more payments than other educational groups. For instance master / PhD graduates pay on average 113 TL per month and miss[12] 14% of the contribution payments while primary school graduates pays 205 TL and their rate of mispayment is 2%.

The average contribution amounts for each year is shown in Figure 10. Our data only includes the first quarter of 2013, thus to compare years, the bar graph illustrates the average amounts for first quarters of each year. Monthly

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12 Here missing a payment means that the contribution amount for that observation is zero TL.

contribution amounts paid by a participant is not the same throughout the contract's duration in the system. Yearly increase in contribution amounts, thereafter referred as regular increase, are determined by the rate of the index chosen by the participant at contract's establishment. 99% of the sample are indexed either by consumer price index (CPI) or by wholesale price index (WPI). Thus one can not directly conclude that the change in incentive mechanism causes the increase in average contribution level in 2013. The increase can be attributed to higher rates of CPI or WPI occurred in 2012. Policy's effect on contribution levels will be further discussed in Section 4.2.2.

In the sample, overall on average 75% of the contributions are paid, and only on average 68% were paid in time. Overdue contribution payments are on average make up only 7% of the sample, indicating that there exists missed (not paid) contributions by the participants. 21,343 contracts did not miss a payment during their duration in the system and 94% of them are still active in the IPS by the end of March 2013. On average the number of consecutive contributions to the pension fund without missing any payment is 17 months, whereas on average the number of months that contribution payment was expected but not paid is 43.

Figure 11 shows the mispayment ratio [13] declines after the policy implementation. Mispayment, during ratio calculation, is not controlled for stalled contributions[14], nevertheless only 8% of the missed contributions are stalled which does not change the ratio. The probability of a contribution which is missed, but not stalled, is to be paid next month is 7.24%, while a paid contribution can be missed by 2.89% probability among active participants. This constitutes one of the main concerns of the IPS in Turkey, namely the participant's attachment to the system. Attachment problem can be explained as participant's disposition to stop contributing to the system, to miss contribution payments (mispayment) after spending a period of time in the system.

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[13] Mispayment ratio, η, defined as: $\eta = \left\{ \dfrac{\sum^t \sum^i mispayments_{it}}{\sum^t \sum^i allpayments_{it}} \right\}$ where $mispayment_{it} = 1$ if there is no payment date; i stands for contract, and t for month. Mispayment ratio is calculated for three-month periods.

[14] Contribution stallment is an option provided by the provider to its clients. By informing the pension company before, participant have the right to stall contribution payments for a period determined by the participant himself. Since the pension company has prior knowledge about the future contributions, stalled payments differ from unanticipated mispayment.

The shift in the incentive mechanism and new regulations brought by the new Law on the IPS aims to alleviate the attachment problem, but its investigation is beyond the scope of this thesis.

4.2 METHODOLOGY

The introduction of the direct government matching to the IPS is in part related to the limited exposure of the participants to tax-advantage. The utilization rate was around 35% among the active participants of the system, and benefited those from the highest quantile of income distribution. Therefore the new regulation of state subsidy on contributions is expected to appeal the lower income groups, and those who were previously not eligible to benefit from the incentive mechanism.

The aim of this research is to investigate the immediate impact of the policy shift from tax-advantage to government matching contribution in Turkish private pension system. We employ panel data covering the periods from December 2005 to March 2013 to examine whether the anouncement and introduction of government matching affect the composition of new participants to the system and have an impact on their contribution amounts. This section first provides the characteristics of new entrants and compare them with incumbent participants, and then specifies a model to observe the participant's response to the policy change in terms of their changes in contribution levels.

4.2.1 *Composition of New Entrants*

We examine the effectiveness of the policy to reach its target population and its impact on composition of the participants. To this end, firstly we conduct a before and after descriptive analysis, taking the time of government subsidy anouncement in July 2012, as the point of comparison. In other words, the first before and after analysis compares the *stock* of active contracts in the system from the beginning of the data with the *flow* of contracts which entered the system after the new policy's anouncement in July 2012. Secondly we analyze the *flow* of new entrants by comparing

the individual characteristics of the new participants who enter the system between January - March 2013 with the new entrants of the system for the same period in previous year, in 2012. The compositional effect is examined through income, education, occupation, gender, age category and marital status of participants. The significance of the changes are tested by sample mean comparison tests. [15]

The change in composition may be on account of a time-trend or of some special feature of that specific period. To eliminate this to a certain extent, the results are controlled by placebo samples. Placebo samples replicates the anouncement and implementation periods by pulling the dates one year before. For instance, the placebo analysis for *stock vs. flow* of contracts holds July 2011 as the benchmark date, and assumes that there has been an anouncement, even though there was not. Then the data for placebo analysis spans from December 2005 to March 2012, to make the analysis comparable. In the *flows vs. flows* analysis, the placebo sample includes the first quarters of 2011 and 2012 to elicit whether the changes in composition is attributable to the change in incentive mechanism.

4.2.2 *Contribution Levels*

Revocation of the tax-incentive and its replacement with direct government subsidy may affect participant's contribution amount. Other than maintaining status-quo, participants can take two course of actions towards the policy change in terms of contribution levels. To gain more from the policy, a participant may prefer to increase his monthly contribution amount, thus save more in pension fund.[16] On the contrary, a participant may lower his contribution amount, since government matching serves as a subsidy and creates income effect.

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15 Two-sample mean comparison test's null hypothesis is: $H_0 : mean(sample1) - mean(sample2) = 0$, where as the alternative hypothesis is $H_a : mean(sample1) - mean(sample2) \neq 0$.

16 This additional contribution may be new saving or simply as a result of portfolio reshuffling.

The effect of incentive shift on contribution levels can be estimated by a base line fixed effect model:

$$y_{it} = \beta_0 + \beta D_t + \gamma(timetrend)_{it} + \theta(tenure)_{it} + \mu_i + \varepsilon_{it} \qquad (4.1)$$

where y_{it} is the contribution amount[17] of participant i at time t, D_t is the policy dummy, μ_i is individual fixed effects, and ε_{it} is the error term. The policy dummy, D_t, captures the anouncement and implementation effects of the policy separately, defined as:

$$D_t^{anouncement} = \begin{cases} 1, & t = \textit{July 2012, ..., December 2012} \\ 0, & \textit{otherwise} \end{cases}$$

$$D_t^{implementation} = \begin{cases} 1, & t = \textit{January 2013, February 2013, March 2013} \\ 0, & \textit{otherwise} \end{cases}$$

The average contribution amounts follows an upward trend in the last four years illustrated in Figure 10. The difference between average contributions of the first quarter of 2012 and of 2013 is the highest when compared with other periods. Nevertheless the increase in difference between the periods can not be directly attributed to the incentive shift. Since most of the private pension contracts are indexed by WPI or CPI, contribution amounts are subject to a *regular* increase at least once in a year.[18]

Even tough a contract is indexed, the participant holds the right to increase or decrease his contribution amount at any point in time. The nature, amount and time of these *discretionary changes* are available in the data set[19]. More than half of the active contract-holders did not initiate any discretionary change in their contributions, whereas 21% changed their contributions only

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17 As shown in Figure 9, there exists very high contribution amounts with low densities. These amounts are omitted during estimation, thus $y_{it} \leq 875TL$

18 There exists three time frames when a regular increase at the rate of the predetermined index can occur: once in a year at the establishment month of the contract, once at the beginning of the year, or twice in a year in January and July.

19 Discretionary changes are used interchangeably with voluntary changes.

once. Voluntary changes in 89% of the payments are increases in the amount.

The outcome variable is *discretionary change* in contribution amounts. This variable signals the behavioral response of the participant towards incentive shift and it also obviates the timing problem of the regular increases in contribution levels. The dependent variable is then not the level of contribution itself but the *amount of discretionary change* in contribution amounts, $\triangle y_{it}^{v}$. This variable is defined as:

$$\triangle y_{it}^{v} = \begin{cases} \triangle y_{it} & \text{, if } vc\text{=}1 \\ 0 & \text{, otherwise} \end{cases}$$

where *vc* is a dummy variable indicating the time of discretionary change in the contribution amount. Then if the change in contribution level is due to indexation, $\triangle y_{it}^{v} = 0$.

The first difference of y_{it} at the time of voluntary change is:

$$\triangle y_{it} = \begin{cases} y_{it} - y_{i(t-1)} & \text{, if } y_{it} \neq y_{i(t-1)} \\ y_{i(t+1)} - y_{i(t)} & \text{, if } y_{i(t-1)}\text{=}y_{it} \\ y_{i(t+2)} - y_{it} & \text{, if } y_{i(t-1)}\text{=}y_{it} \text{ \& } y_{i(t+1)}\text{is missing} \\ y_{it} - y_{i(t-2)} & \text{, if } y_{i(t-1)} \text{ is missing} \\ y_{i(t+1)} - y_{i(t-1)} & \text{, if } y_{it} \text{ is missing} \end{cases}$$

It is important to note that in some cases $\triangle y_{it}^{v} = 0$ even if the change is voluntary. The main reason is the long sequences of missed payments, thus the voluntary change can not be considered as an actual response. Thus $\triangle y_{it}^{v} = 0$ if $y_{i(t+k)} = 0$ for $|k| \geq 2$.

Defining the outcome variable as difference from its lagged value, the base line model can not be specified as a fixed effects model. This is because the fixed effects model performs ordinary least square estimation on the devia-

tion from the individual means[20]. Since the dependent variable is already in changes, the model needs to be transformed into changes specification:

$$\Delta y_{it}^v = \beta(\triangle D_t) + \gamma(\triangle timetrend)_i + \theta(\triangle tenure)_i + \triangle \mu_i + \triangle \varepsilon_{it} \qquad (4.2)$$

Both time trend and tenure are time-varying variables for each contract increasing by each month spent in the system. Taking the difference with their lagged values produce $\triangle timetrend = 1$ and $\triangle tenure = 1$. Since μ_i is time-invariant characteristics of the individuals, differencing μ_i with its lagged values for each contract yields $\triangle \mu_i = 0$. Then the base model to estimate the effect of policy shift on differences in voluntary changes in contributions is reduced to:

$$\Delta y_{it}^v = \beta(\triangle D_t) + \gamma(1) + \theta(1) + 0 + \triangle \varepsilon_{it}$$

$$\implies \quad \Delta y_{it}^v = (\gamma + \theta) + \beta(\triangle D_t) + \triangle \varepsilon_{it}$$

$$\implies \quad \Delta y_{it}^v = \alpha + \beta(\triangle D_t) + \triangle \varepsilon_{it} \qquad (4.3)$$

where $\alpha = (\gamma + \theta)$.

The policy shift from tax-advantage to government matching alters the rate of return for participants. The response for the difference in the effective rate of return, as a result of the revocation of the tax-advantage, varies by income levels. Then the interaction model for income and education enables us to observe how the response for each group differs from each other.

$$\begin{aligned} \triangle y_{it}^v = \ & \gamma_1(lower \times \triangle D_t) + \gamma_2(low \times \triangle D_t) + \gamma_3(middle \times \triangle D_t) + \\ & \gamma_4(high \times \triangle D_t) + \gamma_5(higher \times \triangle D_t) + \qquad (4.4) \\ & \gamma_5(unknown \times \triangle D_t) + u_{it} \end{aligned}$$

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20 Fixed effect models take the the form: $y_{it} = X_{it}\beta + Z_i\gamma + \mu_i + \varepsilon_{it}$ where Z_i is individual's time-invariant characteristics, μ_i is unobserved time-invariant variable, and ε_{it} is the error term; taking the individual means over time: $\overline{y}_{it} = \overline{X_{it}}\beta + Z_i\gamma + \mu_i + \overline{\varepsilon}_{it}$ and subtracting the the fixed effects estimator is attained by regression $y_{it} - \overline{y}_i = (X_{it} - \overline{X}_i)\beta + (\varepsilon_{it} - \overline{\varepsilon}_i)$ by ordinary least squares.

$$
\begin{aligned}
\triangle y_{it}^v \;=\;\;& \theta_1(edu^{primary} \times \triangle D_t) + \theta_2(edu^{secondary} \times \triangle D_t) + \theta_3(edu^{high} \times \triangle D_t) + \\
& \theta_4(edu^{higher} \times \triangle D_t) + \theta_5(edu^{mphd} \times \triangle D_t) + w_{it}
\end{aligned}
\tag{4.5}
$$

Then the Equations 4.4 and 4.5 yields estimates for policy responses across different income and educational groups, respectively.

RESULTS

THE IMPACT OF INCENTIVE SHIFT ON THE COMPOSITION OF THE IPS
PARTICIPANTS

The compositional changes in *stock versus flow* of active contracts, taking
July 2012 as a point of reference, are reported in Table 8. Until the policy
change was announced, there has been 21,804 incumbent active contracts.
After the anouncement 9,106 new contracts, which are still active in system,
established.

As stated at the very beginning of this research, government's objective
by enforcing the matching contributions to the IPS is to stimulate domestic
savings by encouraging low and lower income groups to save by incorporat-
ing those groups in private pension system. In the post-anouncement period,
42.6% of the new entrants declare that they earn middle income. When com-
pared to pre-announcement period middle income's share in income compo-
sition increases by 14%-point which is statistically significant, and so is low
income group's increase by 4%-points.

Figure 1: Income Analysis of Stock of Active Contracts
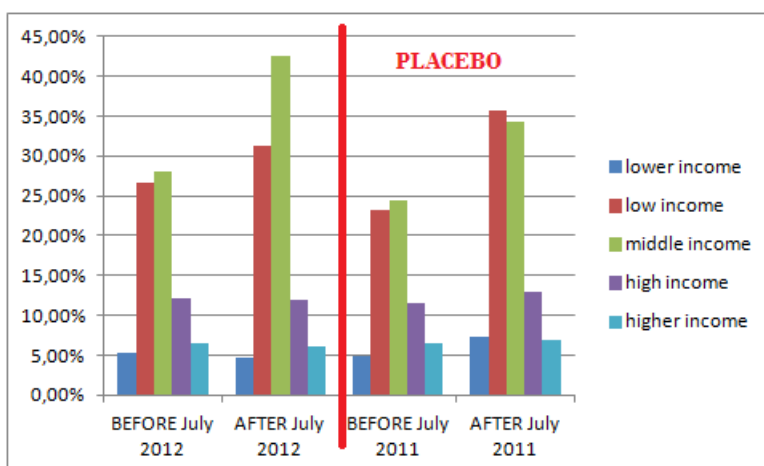
However when controlled with the changes in placebo analysis, in Table 9 and in Figure 1, we observe that the percentage point increase after the policy's announcement is significantly higher for middle income and lower for low income groups. Thus it is not possible to conclude that the increase in low and middle income groups is solely on account of the shift in incentive mechanism.

The educational composition changes slightly in post-announcement period. Before July 2012, secondary school and university graduates dominated the system almost equally (around 40% each), in the post-announcement period the gap between the two widens. While the latter significantly increases by 10%-points, the former drops by almost 5%-points. The same trend is observed in placebo analysis, in which the sign of compositional change for each group is the same, and the rate of change is increasing by each year[1]. Comparing the percentages in Table 8 with Table 9 it is observed that there is a decreasing trend in self-employeds' enrollment to the system. However as the placebo analysis shows there is no change for housewives and retirees between placebo periods. Yet, after the announcement both retirees' and housewives' appearance in the system increase significantly by around 1%-point. The before-after analyses of stock of incumbent participants before July 2012 versus the flow of new entrants after, demonstrate that participants who enter into the IPS after the anouncement are older than the incumbent participants. While the young participants' share decreases in the sample, participants' who are older than 45 increases. When compared with placebo samples, the trends are different and the compositional change is significant.

Unlike the before and after analysis of stock vs. flow of active contracts, the analysis of *flows* of active contracts for the same period of consecutive years sheds more light on the policy's compositional effect. As discussed in Section 4.2.1, the analysis of the flow of active contracts involves the comparision between the first quarters of 2012 and 2013. The composition of new entrants, stimulated by the policy and of the previous year is given in Table 10. The placebo analysis is illustrated in Table 11.

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1 Except for the primary school graduates.

Figure 2: Income composition of new participants across the first quarter of last 3 years
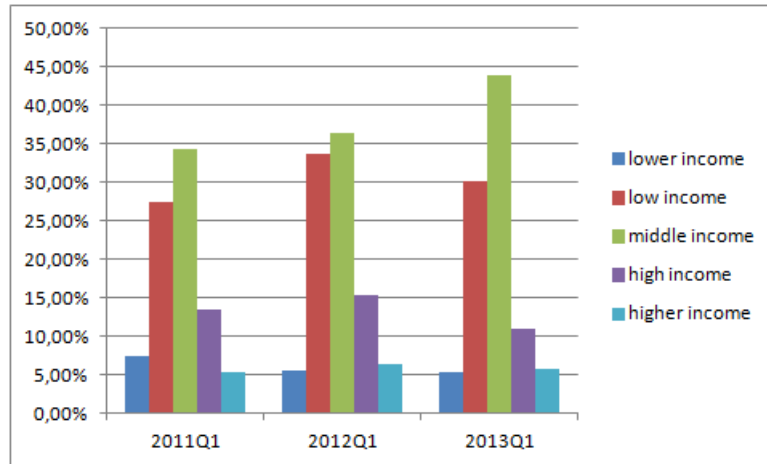
The bar chart above demonstrates the income composition of the new entrants to the system in the first quarters of last three years. Until 2013, low income groups entered the system in increasing numbers, however after the implementation of government matching contributions the number of low income participants drops significantly[2]. Even tough there was an increase in middle income's participation to the system from 2011 to 2012, this increase is not statistically significant and does not change the composition. The upward change in middle income entrants from the same period of 2012 to 2013 is significant and widens the gap between low and middle income groups. Therefore it can be concluded that the government matching, in the first three months after implementation, does not reach its target, low and lower income groups. Another interesting point to highlight is the significant decrease in the enrollment of high income groups to the system by almost 5%-points.

The number of participants who graduate from an higher education institution increased by more than 5%-points and becomes the dominant educational group in the system, when compared with the same period of 2012. Supported by the placebo analysis in Table 11, the composition of active participans' educational attainment remained same as it was in previous year,

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2 Also controlled for the change in income composition for the same period between the years 2010 and 2011.

yet the introduction of matching contributions decreases the enrollment of secondary school graduates and master/PhD holders decrease significantly around 3%-points each.

Government officials emphasize that unlike tax-advantage, the new incentive scheme is eligible for every Turkish citizen above 18 years old. Therefore the new incentive aims to attract non-tax payers to the IPS, and the most cited examples of non-tax payers are self-employeds, retirees and housewives.

Figure 3: Change in occupational composition
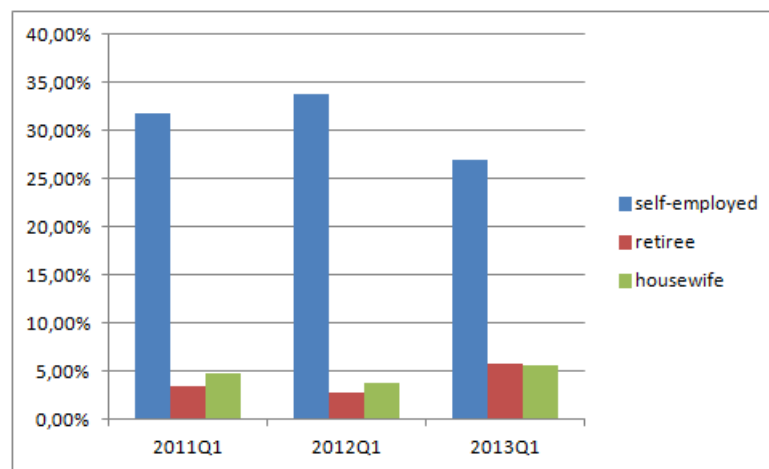
Over the last 3 years, from 2010 to 2012, the composition of participants with respect to their occupation[3] did not change as seen in Figure 3. The enforcement of the government matching is successful to attract the previous no-tax-payers such as retirees and housewives to the system in the first three moths of 2013. Table 10 shows that the percentage of those who declare themselves to be retirees or housewives increase by around 4%-points significantly, whereas the self-employeds' entry drops significantly by 7%-points.

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3 There are 24 distinct occupational groups in the data. We choose only those who are considered as non-eligible for the tax-advantage but for matching contributions.

Figure 4: Change in composition, age
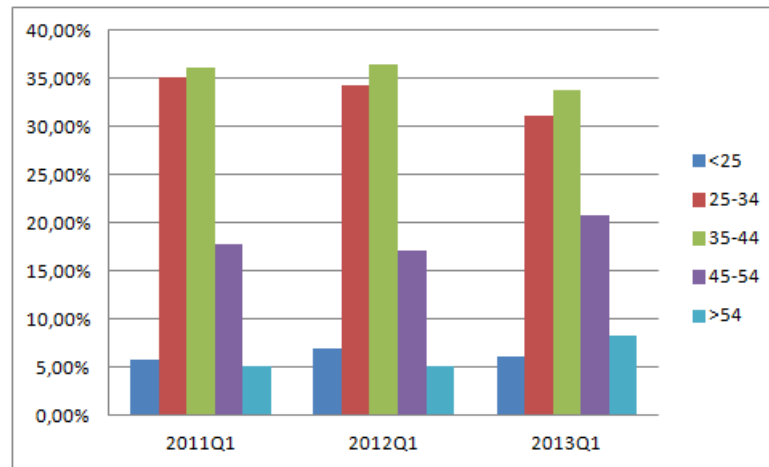
Compared with the same period of 2012, there is a statistically significant change in composition with respect to participants' ages there is a significant increase of older age groups who are above 45. One possible explanation for the higher participation of these age groups is that they become claim the right to retire from the IPS and to collect government benefit earlier than other groups. Then the uncertainty, these groups encounter is lower than other groups who needs to wait until 56 to retire.

THE IMPACT OF INCENTIVE SHIFT ON THE CONTRIBUTION LEVELS

The immediate impact of the incentive shift on the amount of discretionary change of contribution levels modeled in Equation 4.3 is reported in Table 1 below. Since the change in contribution amount pertains the active incumbent participants, the entrants after the implementation are omitted from the regression analysis.

Table 1: Ordinary Least Squares Estimates of the Equation 4.3

Explanatory Variable	(1)	(2)	(3)
Change in implementation dummy, $\triangle D_t^{imp}$	1.515***		1.671***
Change in anouncement period, $\triangle D_t^{ano}$		-0.775***	0.153
Constant	0.609***	0.656***	0.605***

$*p < 0.1, **p < *.05, ***p < 0.001$

Note: The OLS estimates are cluster robust.

The effect of implementation on the voluntarily change in contribution amounts is positive and significant, suggesting that the introduction of government matching contribution leads participants to increase their level of contributions. The announcement effect is negative and when regressed together with implementation dummy it loses its significance. This is an expected outcome since participants do not benefit from the incentive by increasing their contribution amount during the anouncement period. It is important to note that even the coefficients are statistically significant, 1.6 TL per change by the implementation is not economically significant.

To distinguish the impact of the policy change on the difference in voluntarily changed contribution amounts among income groups and educational attainment, differenced dummy variable in Regression 4.3 is replaced by series of interaction terms for each income (education) group as in Equations 4.4 (and 4.5). The OLS estimates of the parameters are given in Table 12. Despite the effect of policy between income groups are statistically and jointly significant, when we test the hypothesis whether the effects are the same, $\gamma_1 = \gamma_2 = \gamma_3 = \gamma_4 = \gamma_5$, we fail to reject. Thus the policy change does not affect the contribution levels across income group differently.

On the other hand, as illustrated in Table 12 policy's implementation affect each educational group significantly. People who are less educated increases their contributions more than other education groups. The joint test of interaction coefficients show that the effect policy's effect across educational groups is not the same, and highest for primary school graduates.

One of the possible reasons that the amount of change in discretionary contribution levels does not vary across income groups is that the income variable itself is a self-declared variable and people are more prone to misinform the company once their income is asked. On the other hand, the information on education is more reliable and more unlikely to change over time. Since our estimates show that the level of change in voluntarily changed contributions varies across educational groups but not across income groups, it is noteworthy to consider the distribution of education with respect to income groups as in Table 13.

In our sample, secondary school graduates earn more than those who attained higher education, while among the higher income earners primary school graduates rank first. Since the latter group's income is higher than other educational groups, their response to policy change by increasing their contribution amount is expected.

CONCLUSION

Turkish government changed the incentive mechanism to boost domestic savings and to cover pension gap. The previous incentive mechanism, the tax-advantage, is revoked and government matching contributions came into force as of January 1, 2013. Since tax-advantage in the IPS is delivered through marginal tax rates, it benefited high income participants and is little or no value to the low income groups. This fact prevails itself in the low utilization rate (35%) of the tax-advantage among the participants of the private pension plans. The government claims that government matching contributions, by its more tangible nature, would appeal low income groups and those who were not eligible to benefit from tax-advantage to save within the IPS.

Our results on policy change's effect on composition of private pension system participants show that the policy reached its target groups only partially in the three-month-period following the implementation of government matching contributions to the IPS. Compositional changes of participants are subtle when stock of active contracts is analyzed with respect to the flow of active contracts entering into effect after the announcement, in July 2012. On the other hand, when the individual characteristics of flow of active contract-holders who enrolled in the IPS between January and March 2013 are compared with the flow of active contracts of the same period of the previous year, the compositional changes are more pronounced.

As discussed in Section 5, the evidence is less compelling for one of the target groups, low-income households. Our analysis indicates that there is an increase in middle-income group's participation to the system, while the low income group's entry decreases. It should be highlighted that the participation rate of high income people to the private pension plans decrease by around five percentage point when compared with the same period of the previous year. The reason of the decreased number of entries by high in-

come group may be related to the reduced return of mutual pension funds in the absence of tax-advantage. Moreover saving in the pension system when the government matching is the incentive mechanism renders saving more illiquid, and thus makes saving to the IPS less desirable for high income group. More university and two-year-degree program graduates begin to save within the IPS after the enforcement of new incentive scheme, whereas the master or PhD holders' participation rate decreases when compared with the same period of 2011 and 2012. The impact of the shift in incentive mechanism in the IPS changes the age composition of participants significantly. The new entrants of the system are older than it was before. This finding is interesting because unlike the life-cycle hypothesis suggests, participants save when they are above the retirement age. The change in policy is successful in attracting housewives and retirees who were not eligible for tax-advantage.

The effect of the policy change from tax-advantage to government matching contributions on the amount of discretionary change is positive and statistically significant, yet as shown in Table 1, the effect is not economically significant. The response to policy change in terms of voluntary increases in contribution amounts does not vary across income groups, but varies across educational groups. The distribution of education with respect to income implies that the less educated participants earn more, and our findings show that the less educated increases their contribution levels more than higher educated participants in the first three months of 2013.

Unlike many of the research on effectiveness of incentive schemes on participation and contribution to private pension plans such as Duflo et al. (2006); Ayuso et al. (2007), we do not have any control group to assess the effectiveness of the government matching contributions because of the large-scale change in the incentive mechanism in the IPS. Our data from the provider serves as a documentation for administrative purposes, thus several variables, such as income, are taken only at the establishment of the contract. Nevertheless its panel structure enables us to follow each participant through time. More research can be conducted on the impact of government matching on high income participants who were highly benefiting from the tax-advantage and would prefer to terminate their contracts and leave the IPS because of the reduced return of the pension fund in the ab-

sence of tax-advantage. Furthermore attachment of participants to the IPS can be investigated in pre and post policy change periods.

APPENDIX

FIGURES

Figure 5: Distribution of Participant's Age Categories
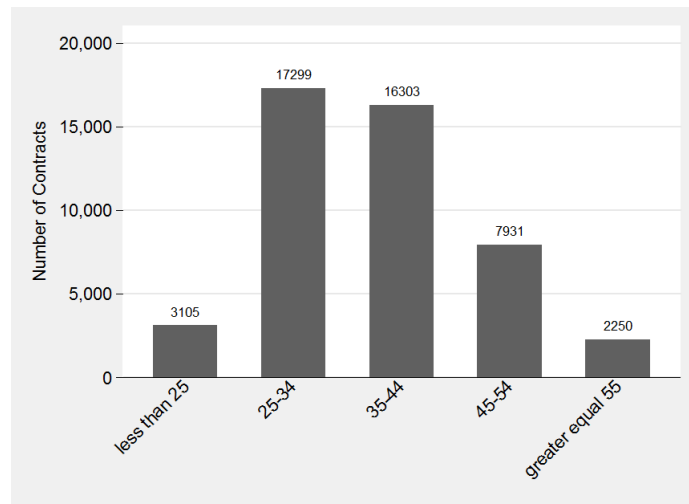
Figure 6: Distribution of Contracts in Force and Terminated by the End of 2012
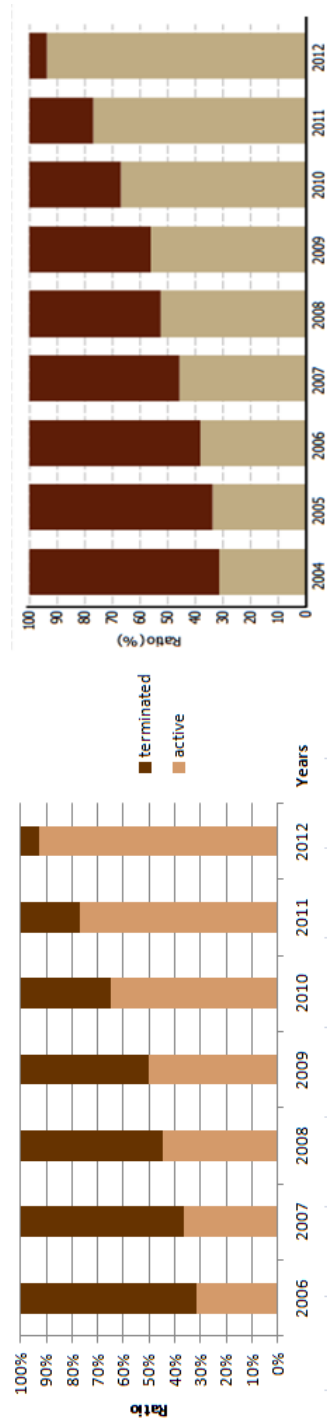
Note: Bar graph on right - *Source: Individual Pension System Progress Report 2012, p.18.*

Figure 7: Entries to the IPS by month
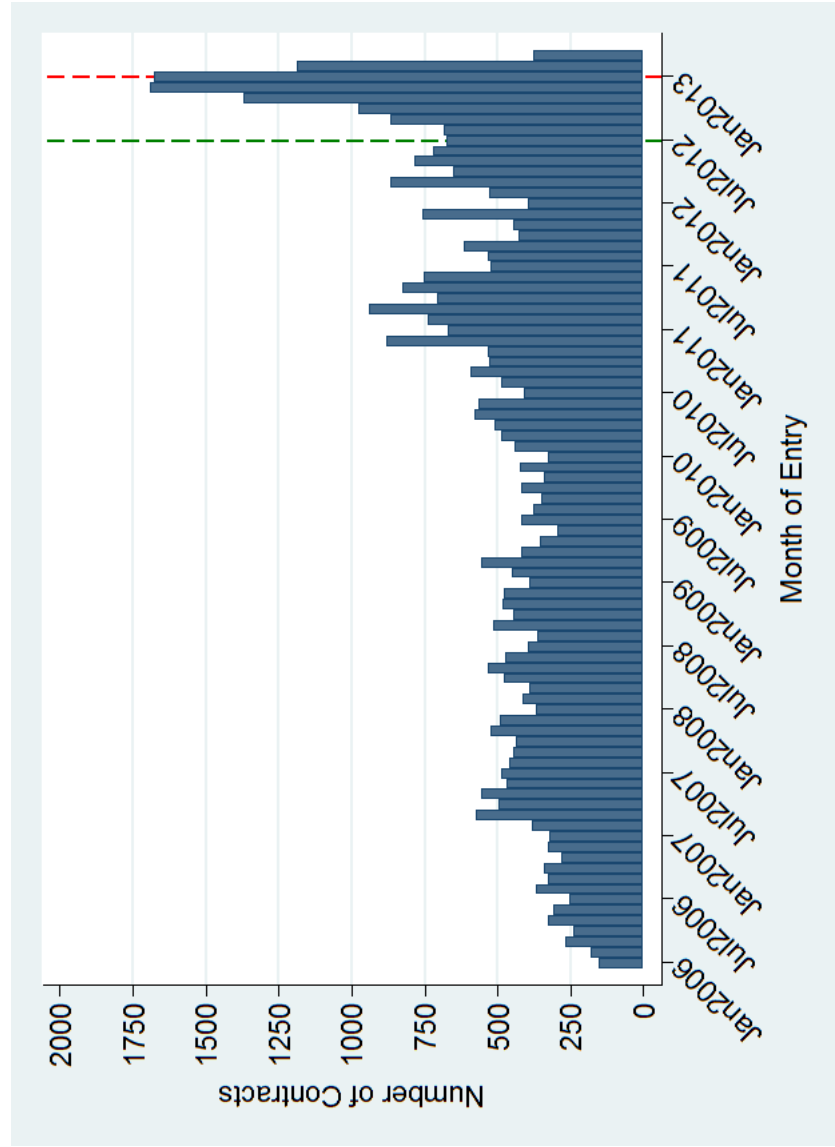
Figure 8: Exits from the IPS by month
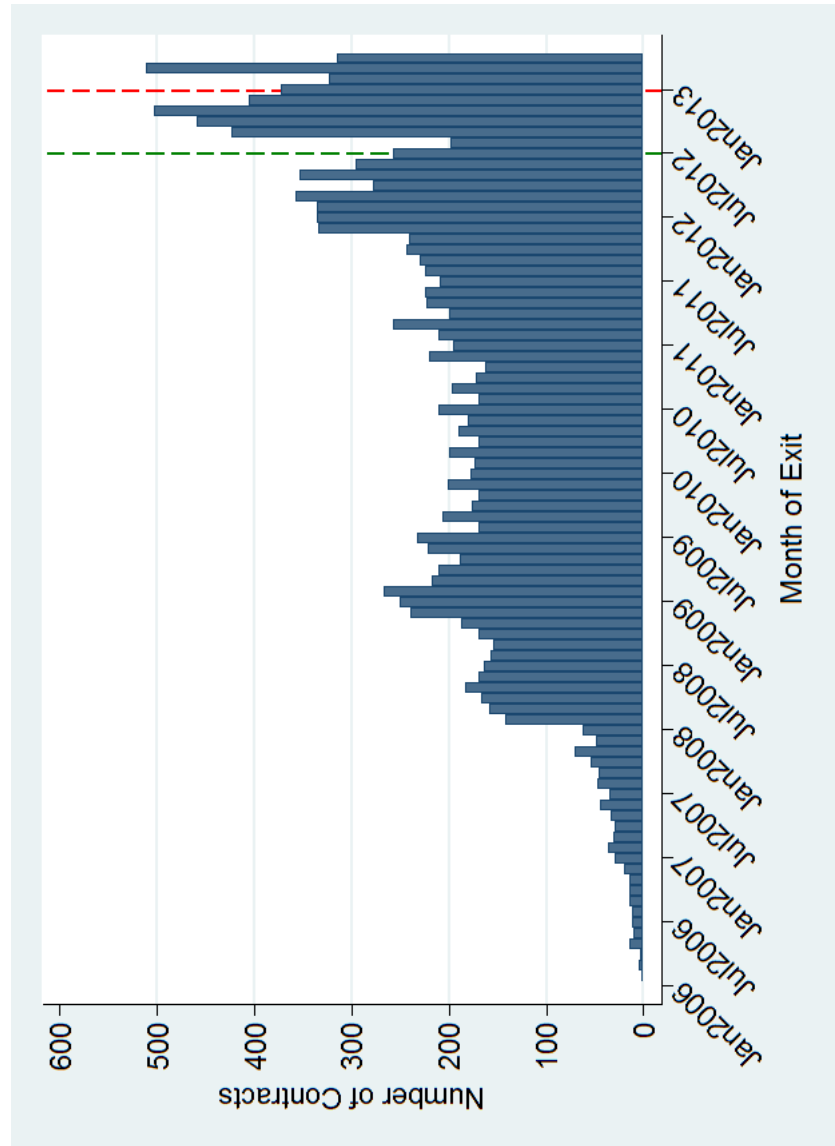
Figure 9: Histogram of Monthly Contribution Amounts
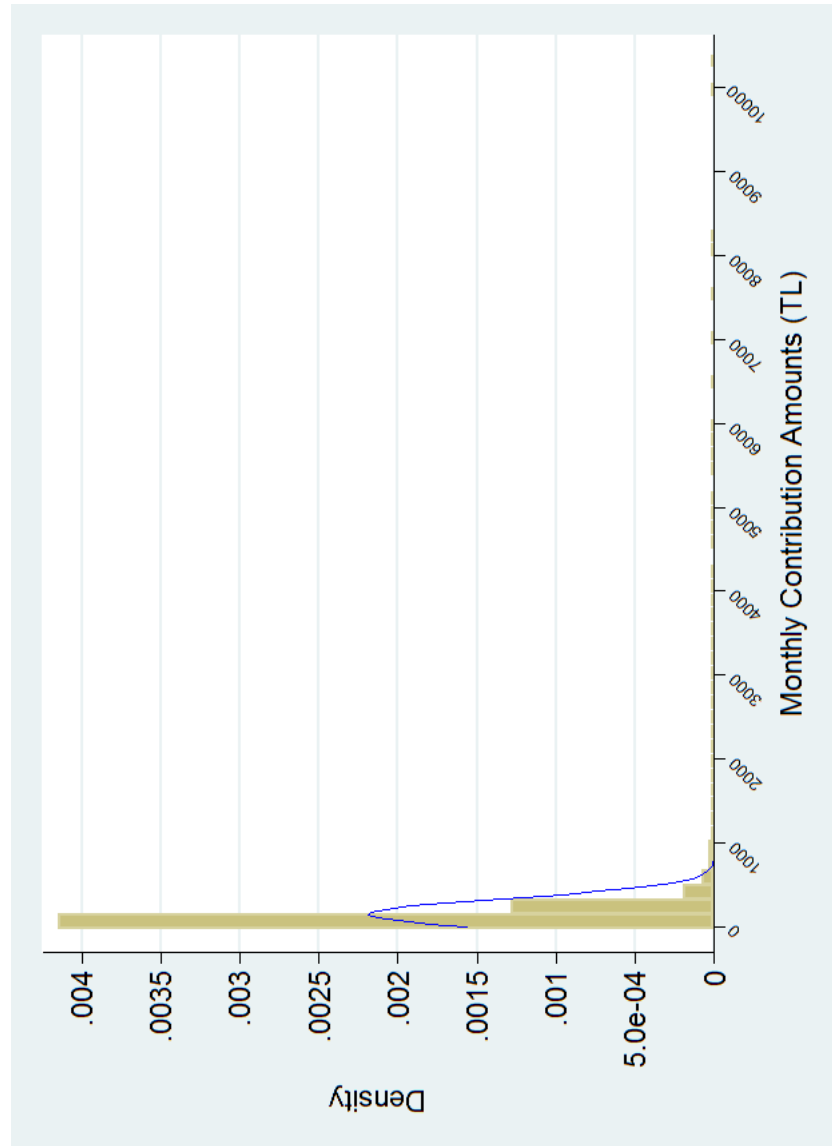
Figure 10: Average Contribution Amounts
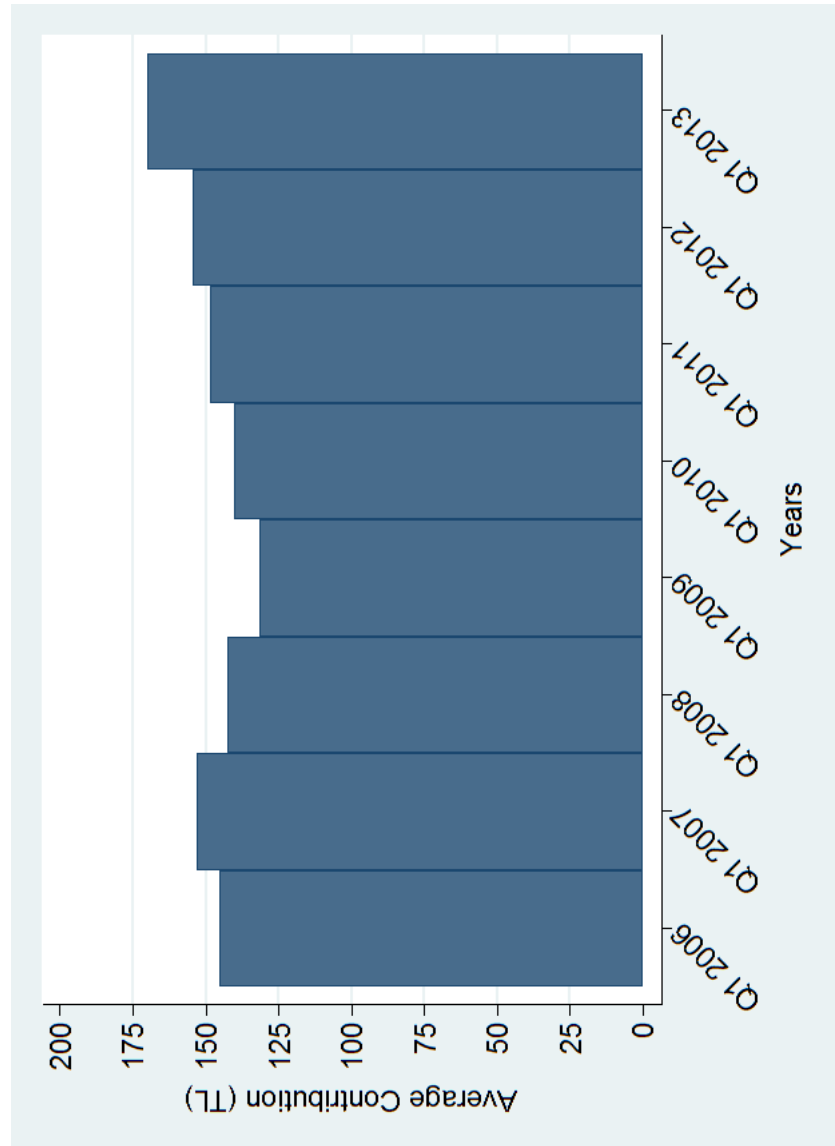
Figure 11: Mispayment Ratio within 3-month periods

B
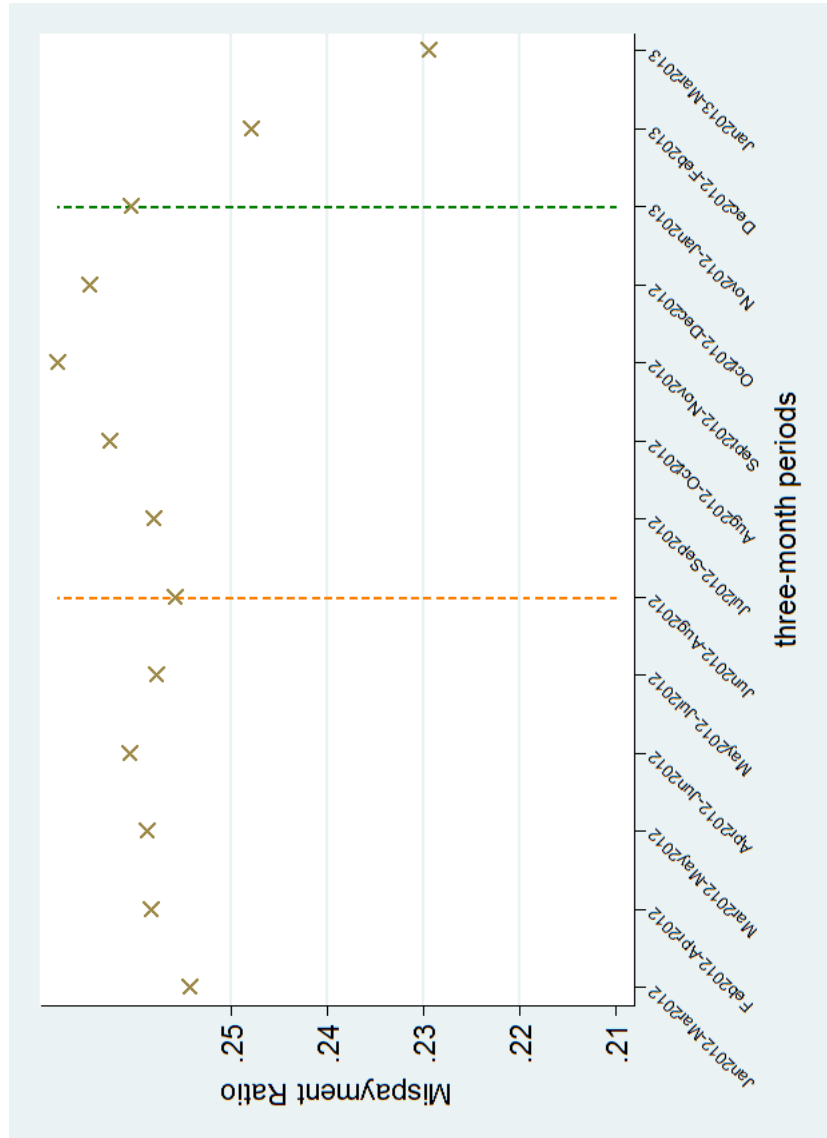
Table 2: The Distribution of Participants' Education

education of participant	distribution in the sample
primary school	4 %
secondary school	40 %
high school	4 %
higher education	43 %
master's and PhD	9 %

Table 3: The Distribution of Participants' Income

income category	range in TL	percentage in the sample
lower income	0 - 1000 TL	4.94%
low income	1001-2000TL	26.07%
middle income	2001-4000TL	28.85%
high income	4001-7000TL	11.42%
higher income	> 7000 TL	6.31%
unknowns	n/a	22.41%

Table 4: Representativeness of Single Firm Data

	Single Firm from the Provider	**Sectoral**
male	72.64%	61.3%
average age	39.5	37.7
average age of entrance	37.5	34.4
Distribution of Active Participants according to Age Categories[†]		
<25	6.3%	6.2%
25-34	34.5%	36%
35-44	35.6%	33.8%
45-54	18.21%	19.2%
>54	5.36%	4.7%
Distribution of Active Participants according to Regions		
Marmara	39%	45%
Central Anatolia	16%	15%
Aegean	19%	17%
Mediterranean	11.5%	12.5%
Black Sea	8%	7%
Southern Anatolia	3.8%	4%
Eastern Anatolia	2.5%	2.5%
Distribution of Contracts in Force and Terminated		
in force (active)	62.7%	60%
terminated	37.3%	40%
Distribution of Contribution according to Payment Instrument		
Credit Card	79.2%	61.3%
Direct Debit	20.4%	23.2%

[†]The distribution of participants according to age categories is calculated by employing sectoral data from `http://web2.egm.org.tr/webegm2/chart/besgosterge/wg_dataview_tablolu.asp?raportip=1` at the end of March 2013.
Note: Other sectoral data is from Individual Pension System Progress Report 2012 published by PMC, and can be found online at `http://www.egm.org.tr/bes2012gr.asp`.

Table 5: Monthly Contribution Amounts (TL), summary statistics

	contribution	contribution> 0 TL	contribution*	contribution*> 0 TL
mean	150 TL	198 TL	138 TL	182 TL
median	132 TL	150 TL	130 TL	150 TL
% of 0 TL	24%	-	24.5%	-
10%	0 TL	100 TL	0 TL	100 TL
25%	50TL	120 TL	42 TL	118 TL
50%	132 TL	150 TL	130 TL	150 TL
75%	182 TL	200 TL	180 TL	200 TL
90%	275 TL	300 TL	264 TL	300 TL
99%	875 TL	1000 TL	600 TL	632 TL
skewness	7.5	8.78	1.64	2.6
N	1,197,933	907,113	1,185,952	895,132

Note: (*) indicates that highest 1% quantile of contribution amounts is omitted.

Table 6: Income and Contribution Amount (CA)

income category	% in sample	mean CA	% of 0 TL CA in all payments	% of 0's within income group	mean CA for CA > 0
lower income	4.94%	89 TL	6.21%	36.5%	140 TL
low income	26.07%	106 TL	22.55%	27.4%	146 TL
middle income	28.85%	142 TL	17.92%	19.4%	176 TL
high income	11.42%	215 TL	7.10%	15.7%	255 TL
higher income	6.31%	327 TL	4.00%	14.7%	383 TL
unknowns	22.41%	133 TL	42.23%	28.5%	186 TL

Table 8: Compositional Analysis: *Stock of Active Contracts vs Flow of New Entrants after July 2012*

PERIOD		BEFORE July 2012	AFTER July 2012		
	# of active contracts	21,864 (59%)	9,106 (96%)	*difference in %points*	*p-values*
income (%)	*lower income*	5.31 %	4.78 %	-0.53%	*0.0513*
	low income	26.55 %	31.27 %	4.72%	*0.0000*
	middle income	28.1 %	42.6 %	14.50%	*0.0000*
	high income	12.1 %	12 %	-0.10%	*0.8126*
	higher income	6.52 %	6.1 %	-0.42%	*0.1258*
	unknowns	21.48%	3.33 %		
education (%)	*primary school*	4.24%	3.22%	-1.02%	*0.0000*
	secondary school	39.95%	35.05%	-4.90%	*0.0000*
	high school	3.97%	4.66%	0.69%	*0.0056*
	university degree	40.56%	51%	10.44%	*0.0000*
	master or PhD	11.28%	6.07%	-5.21%	*0.0000*
occupation (%)	*self-employ*	33.61%	29.1%	-4.51%	*0.0000*
	retired	3.33%	4.29%	0.96%	*0.0000*
	housewife	3.56%	4.51%	0.95%	*0.0001*
gender	*female*	27%	28%	1.00%	*0.0076*
age	*< 25*	6.04%	6.93%	0.89%	*0.0034*
	25 − 34	35.07%	33.13%	-1.94%	*0.0011*
	35 − 44	35.98%	34.79%	-1.19%	*0.0461*
	45 − 54	17.91%	18.93%	1.02%	*0.0330*
	> 54	5 %	6.22%	1.22%	*0.0000*
marital status	*married*	76%	73%	-3.00%	*0.0000*

Table 7: Education and Contribution Amount (CA)

education	mean CA	% of 0 TL CA in all payments	% of 0 TL CA within education group	mean CA for CA > 0
primary school	205 TL	2 %	13 %	235 TL
secondary school	182 TL	31 %	17 %	220 TL
high school	125 TL	4 %	22 %	160 TL
university degree	120 TL	49 %	31 %	174 TL
master or Phd	113 TL	14 %	32 %	167 TL

Table 9: Placebo Analysis: *Stock of Active Contracts vs Flow of New Entrants after July 2011*

PLACEBO PERIOD		BEFORE July 2011	AFTER July 2011	difference in %points	p-values
income (%)	lower income	4.96 %	7.22 %	2.26%	0.0000
	low income	23.24 %	35.79 %	12.55%	0.0000
	middle income	24.48 %	34.35 %	9.87%	0.0000
	high income	11.62 %	12.90 %	1.28%	0.0297
	higher income	6.55 %	7. 01%	0.46%	0.3185
	unknowns	29.15 %	2.73 %		
education (%)	primary school	4.82 %	3.08 %	-1.74%	0.0000
	secondary school	40.94 %	38.14 %	-2.80%	0.0018
	high school	3.83 %	4.73 %	0.90%	0.0117
	university degree	38.12 %	44.47 %	6.35%	0.0000
	master or PhD	12.29 %	9.58 %	-2.71%	0.0000
occupation (%)	self-employ	34.32 %	29.75 %	-4.57%	0.0000
	retired	3.42 %	3.16 %	-0.26%	0.4333
	housewife	3.51 %	4.08%	0.57%	0.0952
gender	female	27 %	29%	2.00%	0.0149
age	< 25	5.48 %	7.95 %	2.47%	0.0000
	25 − 34	34.8 %	36.95 %	2.15%	0.0138
	35 − 44	36.22 %	34.68 %	-1.54%	0.0778
	45 − 54	18.36 %	15.82 %	-2.54%	0.0003
	> 54	5.14 %	4.6 %	-0.4%	0.1794
marital status	married	78 %	70 %	-8.00%	0.0000
	single	22 %	29 %	7.00%	

Table 10: Compositional Analysis: *Flows of New Entrants*

PERIOD: Jarnuary - March		2012	2013		
	# of active contracts	1,604 (90%)	3,099 (96%)	*difference in %points*	*p-values*
income (%)	*lower income*	5.49 %	5.42 %	-0.07%	*0.9250*
	low income	33.73 %	30.2 %	-3.53%	*0.0135*
	middle income	36.47 %	43.9 %	7.43%	*0.0000*
	high income	15.27 %	10.9 %	-4.37%	*0.0000*
	higher income	6.3 %	5.74 %	-0.56%	*0.4468*
	unknowns	2.74 %	3.81 %	1.07%	
education (%)	*primary school*	2.87%	3.16%	0.29%	*0.5785*
	secondary school	38.59%	35.62%	-2.97%	*0.0453*
	high school	4.05%	4.84%	0.79%	*0.2201*
	university degree	45.45%	50.63%	5,18%	*0.0008*
	master or PhD	9.04%	5.74%	-3.30%	*0.0000*
occupation (%)	*self-employ*	33.79%	26.94%	-6.85%	*0.000*
	retired	2.74%	5.71%	2.97%	*0.000*
	housewife	3.74%	5.65%	1.91%	*0.0044*
gender	*female*	27%	28%	1.00%	*0.4606*
age	*< 25*	6.92%	6.16%	0.76%	*0.3156*
	25 − 34	34.35%	31.17%	-3.18%	*0.0270*
	35 − 44	36.47%	33.72%	-2.75%	*0.0602*
	45 − 54	17.08%	20.72%	3.64%	*0.0028*
	> 54	5.17%	8.23%	3.06%	*0.0001*
marital status	*married*	71%	74%	3.00%	*0.0117*

Table 11: Placebo Analysis: *Flows of New Entrants*

PLACEBO PERIOD: January - March	*# of active contracts*	2011	2012	*difference in %points*	*p-values*
income (%)	*lower income*	7.44 %	5.49 %	-1.95%	*0.0223*
	low income	27.44 %	33.73 %	6.29%	*0.0255*
	middle income	34.30 %	36.47 %	2.17%	*0.1913*
	high income	13.43 %	15.27 %	1.84%	*0.1294*
	higher income	5.41 %	6.3 %	0.89%	*0.2743*
	unknowns	1.98 %	2.74 %	0.76%	
education (%)	*primary school*	3.31 %	2.87 %	-0.44%	*0.4584*
	secondary school	37.97 %	38.59 %	0.62%	*0.7107*
	high school	4.48 %	4.05 %	-0.43%	*0.5456*
	university degree	44.24 %	45.45 %	1.21%	*0.4854*
	master or PhD	10 %	9.04 %	-0.96%	*0.3465*
occupation (%)	*self-employ*	31.8 %	33.79 %	1.99%	*0.2224*
	retired	3.49 %	2.74 %	-0.75%	*0.2176*
	housewife	4.77 %	3.74 %	-1.03%	*0.1436*
gender	*female*	28 %	27 %	-1.00%	*0.7462*
age	*< 25*	5.81 %	6.92 %	1.11%	*0.1913*
	25 − 34	35.06 %	34.35%	-0.71%	*0.6691*
	35 − 44	36.05 %	36.47 %	0.42%	*0.7991*
	45 − 54	17.72 %	17.08 %	-0.64%	*0.5320*
	> 54	5.17 %	5.17 %	0.00%	*0.9998*
marital status	*married*	75 %	71 %	-4.00%	*0.0203*

Table 12: Ordinary Least Squares Estimates of Equations 4.4 and 4.5

Explanatory Variable	(7)	(8)
Lower income's interaction with $\triangle D_t^{imp}$	1.215**	
Low income's interaction with $\triangle D_t^{imp}$	2.025***	
Middle income's interaction with $\triangle D_t^{imp}$	2.137***	
High income's interaction with $\triangle D_t^{imp}$	1.820**	
Higher income's interaction with $\triangle D_t^{imp}$	1.831***	
Unknown's interaction with $\triangle D_t^{imp}$	2.840***	
Primary School's interaction with $\triangle D_t^{imp}$		2.822***
Secondary School's interaction with $\triangle D_t^{imp}$		2.703***
High School's interaction with $\triangle D_t^{imp}$		2.037***
Higher Education's interaction with $\triangle D_t^{imp}$		1.578***
Master/PhD's interaction with $\triangle D_t^{imp}$		1.981***

$*p < 0.1, **p < *.05, ***p < 0.001$

Note: The OLS estimates are cluster robust.

Table 13: Distribution of Education with respect to Income

	lower income	low income	middle income	high income	higher income	unknowns
primary school	1.3%	13.4%	28.1%	24.1%	14.7%	18.4%
secondary school	1.7%	19.1%	35.3%	26.5%	10.1%	17.3%
high school	6.0%	38.4%	33.4%	6.1%	3.0%	13.1%
higher education	7.1%	35.9%	31.9%	8.5%	3.5%	13.1%
master/ PhD	11.3%	28.5%	23.5%	8.0%	3.0%	25.7%

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