Decision-Making Traits and the Propensity to Default: Evidence and Implications

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Abstract: Over the past decade, default options have become ubiquitous features of public and private retirement plans because of the powerful effect of defaults on behavior. However, evidence is still limited on why people are sensitive to defaults and why this sensitivity varies across the population. We explore this heterogeneity, examining not only demographic and economic correlates of defaults, but also measures of decision making traits that are well-established in the psychology literature. Using an extensive survey of participants of a large public retirement system in which individuals are faced with a one-time irrevocable choice among three distinct retirement plans, we provide new evidence on economic and psychological characteristics most closely associated with being defaulted rather than making an active choice. In addition to the important role played by economic measures such as income, we find that procrastination and the need for cognitive closure are important psychological determinants of the likelihood of default. We also explore an important implication of defaults: namely, that individuals who default are much more likely to subsequently express a desire to be in a different plan. The desire to switch plans is also correlated with numerous economic and psychological characteristics, again including procrastination. Given the important role of procrastination, we conducted a simple field experiment to show that sending out enrollment reminders closer to the default date have a modest effect of reducing defaults among a subset of the population.

Key Words: Default options, automatic enrollment, retirement, pensions, behavioral economics, decision making

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I. Introduction

One of the most influential contributions of behavioral economics to business practice and public policy over the past decade has been to demonstrate the substantial power of default options in influencing human behavior. Nowhere is this influence more apparent than in the area of retirement plan design and policy. Compelling evidence that shifts in default options dramatically increased participation and savings in 401(k) plans (e.g., Choi et al. 2002, 2004a; Madrian and Shea 2001) prompted the U.S. government to codify automatic enrollment in defined contribution retirement plans in the 2006 Pension Protection Act (PPA). In recent years, we have seen dramatic increases in the use of automatic enrollment, automatic escalation of contributions, and automatic portfolio allocation and rebalancing both in the U.S. and abroad. There have also been calls to extend the logic of defaults to the post-retirement payout phase of retirement plans by encouraging automatic annuitization (Gale et al. 2008).

Although countless studies have documented profound effects of defaults on behavior, we are still limited in our understanding of why defaults have such large effects overall, and, equally importantly, why there is heterogeneity in the responsiveness to defaults. In this paper, we empirically examine the determinants of a default decision in a large public plan that offers an irrevocable choice among three retirement plans (a traditional DB, a portable DB, and a DC plan). In addition to examining the full range of economic and demographic variables, we also study the role of several decision-making traits from the psychology literature. These include measures from the well-known Melbourne Decision Making Questionnaire, as well as several other measurement scales, which we included as part of a broader survey that we conducted among participants in State Universities Retirement System (SURS) of Illinois. As we will discuss in more detail below, these validated measures from the psychology literature are

intended to capture differences across individuals in how they make decisions in complex settings. In all, we collected survey responses from over 6,000 public university employees in the State of Illinois during Fall 2012.

We first study the binary outcome of whether or not individuals made an active retirement plan choice or whether they were defaulted into the traditional DB plan (individuals are defaulted six months after joining the system unless they make an active election prior to that date). In our data, approximately 27% of respondents defaulted whereas the remainder actively chose among the three plans. We find a numerous demographic and economic variables influence the propensity to default: for example, higher income and higher net worth individuals are substantially less likely to default, as are women, those with higher self-assessed investment skills and those with greater knowledge of the system.

With regard to decision-making traits, we find that a tendency toward procrastination is significantly positive correlated with the likelihood of default. Numerous authors have speculated that procrastination is a plausible reason for default, although this has not been shown empirically. This finding is quite intuitive: those with a tendency to procrastinate are less likely to "get around" to making an active decision before the deadline. It is also consistent with body of economic theory that portrays procrastination as an outcome of present-biased preferences (Akerloff 1991, O'Donoghue and Rabin 1999). In this view, people with present-biased preferences tend to systematically overweight the cost of making a decision today without fully incorporating the fact that they will do the same tomorrow, a tendency that manifests itself as procrastination.

We also find that individuals with a stronger "need for cognitive closure" are *less* likely to default. Kruglanski (1990) defines the need for closure as a desire for ''an answer on a given

topic, *any answer* ... compared to confusion and ambiguity" (p. 337, emphasis added).[1] A need for cognitive closure is therefore a natural trait to explore as a potential mitigating influence on default behavior.

Having established that individual decision-making styles are important determinants of default propensities, we then turn to understand how individuals evaluate the suitability of their retirement plan *ex post*. We do this by asking respondents "if you could go back in time and redo your original pension choice (assuming the rules when you joined SURS are still in place), which plan would you choose?" We also ask them on a 5-point scale how strong is their desire to go back in time and redo their choice. We find that individuals who were defaulted into the DB plan are about 20 percentage points more likely to express a desire to be in a different plan. This is true even relative to those who actively chose the same DB plan into which others were defaulted, suggesting that it is the default behavior rather than the plan itself that is driving this desire to switch. We also find that the proportion of those who would "strongly desire" to switch plans is significantly greater among defaulters than among active choosers.

We regress the desire to change plans against the same set of economic, demographic and decision-making characteristics from above. We again find that procrastination is important: individuals who procrastinated their way into the default option are significantly more likely to desire to be in a different plan. We also find other decision-making traits are important in this context, including hypervigilance, buck-passing, and the need for cognitive closure, which we will discuss more below.

The finding that procrastination leads to defaults, and the finding that procrastinators are more likely to subsequently express a desire to be in a different plan, is important for assessing

[1] The full Need for Closure Scale was developed by Webster & Kruglanski, 1994. We use the shorter, 15-question version from Roets and Van Hiel 2011.

the welfare consequences of defaults. The use of defaults is often portrayed as a Pareto improvement because a well-designed default can guide individuals into making potentially welfare-improving decisions while still providing the freedom to choose. But if individuals end up dissatisfied with the results of the default, especially in settings like ours where the default is irreversible, this suggests caution in relying heavily on default options as opposed alternatives such as forced choice. It also raises the question of whether a plan sponsor can take steps to decrease the tendency of procrastinators to default.

To explore this, we implemented a field experiment to assess whether a change in the timing of the enrollment reminder could induce more individuals to make an active election. Working with SURS staff, we randomized new hires into two groups, one that received the enrollment reminder two months prior to the default deadline (the standard SURS intervention), and one that received the identical reminder 2-3 weeks prior to the deadline. In total, we randomized nearly 6,000 new hires into one of these two groups between July 1, 2013 and February 5, 2014. Although we do not find a significant difference among the two groups in the full sample, we do find a statistically significant 2.8 percentage point increase in the probability of making an active choice among staff members, and an even larger increase (3.8 percentage points) among staff under the age of 35. Importantly, the large majority of individuals who were induced by this simple intervention to avoid defaulting ended up actively choosing the Defined Contribution plan option instead of the traditional or portable DB plans.

These results are informative to the broader use of default options in public and private plans around the world. Although the use of default options is both powerful and popular, this paper adds to the small but growing body of research suggesting that defaults can have downsides. Other researchers have shown that poorly designed defaults can reduce welfare if employees fail

to later adjust the defaults to suit their needs (Choi et al. 2002, 2004a, 2004b; Beshears et al. 2008, 2010a) and that optimal defaults can vary depending upon participant characteristics (Carroll et al. 2009; Carlin, Gervais, and Manso 2010; Goda and Manchester 2010). By showing that decision-making traits such as procrastination are important determinants of default behavior, and that defaulters are more likely to subsequently desire to be in a different plan, our results suggest reasons to be cautious in relying solely on defaults to influence behavior.

This paper proceeds as follows. In Section II we summarize prior literature on defaults. In Section III we briefly describe the psychology literature related to decision making. Section IV provides background on the SURS retirement system, and in Section V we describe our survey design. Section VI presents results of analyses of factors associated with the likelihood of default and with the desire to subsequently make a different choice. We also present the results of our randomized experiment regarding the timing of the enrollment reminder. We summarize and conclude in Section VII.

II. Prior Literature on Defaults

The earliest work on defaults in the retirement space showed that changing the 401(k) enrollment procedure to one in which a participant must actively opt *out* of a plan rather than actively opt *in* dramatically increases plan participation (Madrian and Shea 2001). Additional research has shown that changing the default savings rate and default investment allocations increase participant savings (Choi et al. 2002, 2004a). This early work, as well as industry experience, propelled policy conversations that led to the U.S. government paving the way for more widespread use of automatic enrollment in defined contribution retirement plans via the

2006 Pension Protection Act (PPA).[2] The PPA and subsequent regulatory actions have also encouraged the widespread use of "Qualified Default Investment Alternatives" (QDIAs) as default portfolio allocations, as well as the use of automatic escalation of contributions. Many financial services firms also now offer automatic rebalancing of portfolios. There have also been policy proposals to enact automatic annuitization (Brown 2009; Gale et al. 2008).

The idea that governments and organizations can influence behavior through the use of defaults and other forms of non-binding approaches is often referred to in academic and popular literature as "soft paternalism" or "libertarian paternalism" (Sunstein and Thaler 2003; Thaler and Sunstein 2003, 2008). Some proponents of libertarian paternalism suggest that careful design of policies and defaults can do more to increase welfare than can providing information to increase individuals' knowledge about their choices (Sunstein and Thaler 2003; Benartzi and Thaler 2007). While retirement plan design has been a very visible and important application of this concept, the effect of defaults on individual choice has been recognized in other domains as well, including e-mail marketing (Johnson, Bellman and Lohse 2002), health care (Halpern, Ubel and Asch 2007), health club memberships (DellaVigna and Malmendier 2006), insurance (Johnson et al. 1993), and organ donation (Johnson and Goldstein 2003; Abadie and Gay 2006).

While libertarian paternalism is often portrayed as an ideological "win-win" by guiding behavior while preserving individual choice, an emerging literature has begun to point out potentially negative consequences. For example, Glaeser (2006) points out that there is a danger of leading individuals to sub-optimal outcomes because those who design policies and choose default options likely bring their own incentives and biases to that task.[3] Others have shown that

[2] Similar legislation was passed in New Zealand in 2006 and the United Kingdom in 2007 (Beshears et al. 2010b).
[3] Glaeser (2006) also discusses a number of other criticisms and negative consequences of over-reliance on libertarian paternalism as a guide to policy, including: (i) soft paternalism can pave the way towards stricter forms of paternalism that reduce welfare by reducing individual choice; (ii) soft paternalism may rely on stigmatizing

poorly designed defaults, such as those with low default savings rates and/or excessively conservative asset allocations, can reduce welfare if employees fail to later adjust the defaults to suit their needs (Choi et al. 2002, 2004a, 2004b; Beshears et al. 2008). At another extreme, Beshears et al. (2010a) examine a setting in which the default savings rate for a defined contribution retirement plan is extremely high, and find that the selected rate is suboptimal for all employees. Additional papers have begun to explore conditions under which defaults are more or less likely to improve social welfare. Carroll et al. (2009) contrast forced active choice, automatic enrollment defaults, and non-automatic enrollment defaults in savings plans and find that forced choice is optimal when participants may procrastinate and/or have heterogeneous preferences, while automatic enrollment is optimal when participants are financially illiterate. Similarly, Carlin, Gervais, and Manso (2010) model conditions under which providing default options for financial decisions may be optimal; they find that even well-thought-out defaults can be detrimental to welfare when participants have heterogeneous attributes and less is known about them, and when the economic stakes of the decision are large. Goda and Manchester (2010) examine the welfare effects of age-based defaults, and find that varying the default option by age groups can result in welfare gains relative to a single default for all age groups.

Although this literature provides insights into when defaults may or may not be optimal, the empirical evidence regarding who defaults and why is more limited. Beshears et al. (2008) propose three reasons that individuals may default, including the complexity of the decision, the belief that the default is a signal or endorsement of the best choice, or that procrastinators never get around to making a decision. Of course, there is also the possibility that default is optimal:

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behaviors, which can then lead to negative consequences for those who choose to engage in those behaviors; (iii) relative to governments and organizations that design paternalistic policies, individuals face stronger incentives to make choices that improve their own welfare; and, (iv) paternalism often relies on persuasion, and governments and organizations have an incentive to abuse persuasion-based systems to enhance their own power.

for example, individuals may deliberately default to minimize transactions costs if they would have chosen the default option anyway, or they may default because they view the choice as inconsequential, such as if they plan to leave an employer before being vested in the retirement plan. Understanding why people default is crucial for evaluating the welfare consequences of relying on defaults as opposed to other interventions.

This paper begins to address the empirical gap by exploring economic, demographic and psychological determinants of default behavior in a high-stakes setting. As a first step in evaluating the welfare consequences, we also examine individual's later subjective satisfaction with the plan in which they are enrolled. This is not only important for individual welfare, but also for the employers who design the default. After all, employers have an incentive to ensure that the significant sums they spend to provide retirement benefits are valued by employees at least as much as a comparable sum spent on wages (Gustman, Mitchell and Steinmeier 1994; Gustman and Steinmeier 2005).

III. The Psychology of Decision Making

Standard economic models of rational consumers assume that individuals make decisions by maximizing expected utility. Indeed, even with the "mainstreaming" of behavioral economics, most economic models of decision-making are still based upon an assumption of optimization, albeit optimization with non-standard preferences (e.g., loss aversion or hyperbolic discounting). Indeed, one of the reasons that economists have found default behavior so interesting is that it is difficult to reconcile the powerful effect of default options with such models.

There is growing acceptance in economics that not all decision-makers are equally capable. For example, Choi et al (2014) run an experiment to test the quality of decisions as measured by

their consistency with Generalized Axioms of Revealed Preference (GARP), and find evidence of substantial heterogeneity in decision quality. Lusardi and Mitchell (2014) summarize the very large literature that documents substantial heterogeneity in financial literacy and its implications for retirement well-being (among other outcomes).

Other research has shown that, when faced with complex decisions, individuals frequently adopt simplifying decision strategies (Wood 1986; Campbell 1988; Payne et al. 1993; Benartzi and Thaler 2007; Bonner 2008). For example, an individual may select only a subset of information to consider, and the selection may not necessarily reflect the relevance of the information to the choice. Individuals may also speed up information processing in response to time pressure, which can introduce error into the choice process. Or they may adopt a simpler processing strategy, which at the extreme may be avoiding the choice all together by accepting default options (Payne et al. 1993; Benartzi and Thaler 2007; Beshears et al. 2008).

This paper draws upon the rich psychological literature on decision-making. An important part of our research focuses on what psychologists refer to as "decision-coping."[4] As we will discuss more below, we use set of surveys to construct four measures associated with what is known as the conflict theory of decision making. This theory is based on the "assumption that stress engendered by decisional conflict is a major determinant of failure to achieve high quality decision making" (Mann et al 1997 p 2). In brief, when faced with stress arising from a difficult decision, not all individuals respond in the same way. A subset will respond in a manner that would be consistent with economic models of optimizing behavior, i.e., by collecting and analyzing relevant information and choosing the outcome that maximizes utility. But others will behave differently: some individuals will ignore information and continue the present course of action, others will adopt whichever course is most strongly recommended, and still others will

[4] The discussion of decision coping draws directly from Mann et al 1997.

procrastinate or shift responsibility. Yet others will "impulsively seize upon hastily contrived solutions that seem to promise immediate relief" (Mann et al. 1997 p. 2). As we will discuss in more detail in the next section, we include in our survey the full battery of questions from what is known as the "Melbourne" questionnaire to construct standard psychological measures of four key decision-coping strategies. We also use other scales from the psychology literature to measure regret, indecisiveness, and the need for cognitive closure, the latter of which is defined as "a desire for ''an answer on a given topic, *any answer* ... compared to confusion and ambiguity" (Kruglanski 1990, p. 337, emphasis added).[5]

IV. Background on the SURS Retirement System

Our decision context is the State Universities Retirement System (SURS) for the State of Illinois. Employees in the system have a one-time irrevocable choice among three different retirement plans which have very different features (to be discussed in more detail below). Individuals who fail to make a choice within six months of joining the system are defaulted into the "Traditional" defined benefit plan, and have no subsequent opportunities to alter that choice. Given that the SURS-covered employment is not covered by Social Security, the retirement plan provided by SURS is meant to replace both Social Security and an employer pension. As such, in addition to being very complex, this decision is enormously consequential.

As background, SURS covers over 200,000 current and former employees of over 65 Illinois universities, community colleges, and state agencies.[6] Participants include university and

[5] The full Need for Closure Scale was developed by Webster & Kruglanski, 1994. We use the shorter, 15-question version from Roets and Van Hiel 2011.

[6] This section updates a prior discussion of SURS in Brown and Weisbenner (2007) where a more detailed description of the SURS retirement plan options can be found. We note that the reduction in the number of employers from 70 (prior paper) to 65 (current figure) reflects the combining of several campuses. Most of the factual information about SURS is drawn from the SURS website (www.surs.org, last accessed 12/11/12).

college administrators, faculty members, clerical and support staff, campus police, and others. SURS withholds eight percent of a participant's salary as a contribution to his/her retirement plan. Social Security taxes are not withheld and participants do not earn credit toward Social Security benefits based on their earnings from a SURS-covered employer. The state/employer contribution for an employee varies by retirement plan type, and because all SURS participants are employees of the State of Illinois, these employer contributions are a general state obligation.

From its inception in 1941 until 1997, all participants in SURS were covered by a traditional defined benefit plan. In 1997, the Illinois Legislature passed a law allowing SURS-covered employers to offer participants a choice from among three plans, and virtually all did so by 1999. The choice now offered by SURS employers is enormously complex due to the myriad ways in which the three plans differ.

The defined benefit plan, called the "Traditional Plan," remains one of the three plan options, and is the default option for participants who do not make an active choice within six months of the date that SURS receives certification of their employment. Participants contribute eight percent of salary for the Traditional Plan, an amount that is meant to cover the employee's share of the normal retirement benefit, automatic annual increases in retirement benefits, and survivor benefits. The state's share of the normal cost of maintaining the plan has varied over time, but the Illinois legislature has a long history of under-funding the plan and thus the state contributions are rarely made in full. Benefits are paid as joint and survivor life annuities; single participants can take one-eighth of their contributions plus interest as a lump-sum at retirement in lieu of the survivor benefits. There are two formulas for calculating the annuity – a standard DB formula and a money purchase calculation – and a participant receives the larger of the two

amounts (State Universities Retirement System of Illinois 2009).[7] While the Traditional Plan is fairly generous for those who retire from the system, it is less so for those who leave early.

The second plan option, the "Portable Plan," is similar to the Traditional Plan but has a few key differences. First, if a participant leaves the SURS system before retirement and takes a refund (i.e., "cashes" out his/her pension), s/he receives a much higher refund than under the Traditional Plan. Second, those who refund from the Portable Plan receive a dollar-for-dollar matching contribution from the employer, whereas those who refund from the Traditional plan receive only employee, and not employer, contributions. Third, the effective interest rate for the Portable Plan is determined annually by the SURS Board of Trustees and is typically higher than the rate provided by the Traditional Plan.[8] Fourth, if a participant retires from the SURS system, the Portable benefit is paid as a single life annuity, and married participants must accept an actuarial reduction to convert it to a joint and survivor annuity. Thus, for participants who leave SURS service and take refunds, the Portable Plan is more generous than the Traditional Plan, but for those who retire from the SURS system the benefits from the Portable Plan are not as generous as those from the Traditional Plan.

The third plan option, the "Self-Managed Plan," is a participant-directed defined contribution plan that invests 14.6 to 15.1 percent of salary (eight percent from the employee and between 6.6 and 7.1 percent from the employer[9]) into a participant's account. Participants are able to choose from a variety of mutual funds and annuity contracts from Fidelity and TIAA-CREF. Upon full vesting after five years of service, a participant who leaves SURS service is

[7] The money purchase formula was eliminated for new participants in 2005.
[8] The Traditional Plan provides an interest rate on contributions of 4.5 percent, whereas the interest rate applied on Portable Plan funds has averaged 8.8 percent over the period from September 1989 through June 2010.
[9] The 6.6 percent rate was in effect from the plan's inception until the past few years. More recently, the rate has risen as SURS has determined that the cost of providing disability benefits to Self-Managed Plan participants was not as high as previously calculated.

entitled to a full refund of both employer and employee contributions plus investment gains/losses. Upon retirement, the participant can choose from a wide range of annuities or a lump-sum distribution.

Participants must make their choice of retirement plan within six months of the date on which SURS receives certification of employment from the employer (which is essentially the date of hire). If they do not do so, they are automatically enrolled in the default option, which is the Traditional Plan. Importantly, plan choice, including enrollment in the Traditional Plan by default, is permanent and irrevocable. For many years, SURS has sent an enrollment reminder letter to individuals that have not made an active choice within the first four months of being hired, or two months prior to the enrollment deadline.

A complete comparison of the three plans is extremely complex and involves consideration of multiple information items, some of which are not immediately evident in the basic enrollment materials. For example, a participant who leaves SURS service may take a lump-sum refund, but the difference in the refund between the Portable and Self-Managed Plans is small prior to being vested (which is less than five years for most participants in our sample) but is much larger after vesting. For participants who retire from SURS, the expected value of the Traditional or Portable Plans is higher than that of the Self-Managed Plan due to factors such as differing match rates, differing interest rate assumptions, and more generous annuitization rates in the Traditional and Portable Plans than are available in the private sector. There are also countless other complexities that make it very difficult to make an optimal plan choice.

In light of the complexity and importance of this decision, it is a natural setting in which to understand decision-making heterogeneity.

V. Survey Design and Sample Statistics

V.1 Survey Methods

In cooperation with administrators at SURS, we administered a web-based survey of SURS participants. The target population was SURS participants with an active e-mail address on file who joined the system in or after 1999, to ensure that the participants made their SURS plan choice as new employees. SURS sent these participants an e-mail in August 2012 inviting them to participate in the survey, with a link to the on-line survey if they wished to do so. Participants received two subsequent reminder invitations in approximately two-week intervals. In total, out of 60,625 valid emails, we received 6,065 usable responses, for a ten percent response rate.

SURS sent four separate invitations, one each for active choosers of each of the three plans and one for those who defaulted into the Traditional Plan.[10] Thus, we know the actual plan choice of each respondent as listed in SURS administrative records, as well as whether the plan choice was active or by default. The four surveys differed in only minor ways as noted below.

The survey questions were designed to capture three broad categories of data. First, questions early in the survey captured respondents' basic demographic information such as gender, marital status, age, employment, education, income and net worth. We also included several questions to capture risk preferences, investment skills, and financial literacy.

Second, questions captured respondents' experiences with and recollections of SURS plans, the enrollment process, and their desire to switch plans if they could. These questions are the only ones that varied across the four surveys. Specifically, respondents who defaulted were asked to rate the importance of a variety of reasons that led to the default. Further, after being asked their recollections of their plan enrollment status, all respondents' actual enrollment status per SURS records was revealed to them; this revelation differed across the four surveys.

[10] All surveys were approved by the Institutional Review Boards at the authors' institutions.

Third, we used widely used and validated questionnaires from the psychology literature to capture respondents' decision-making styles and decision-relevant traits. Given the sheer number of questions required to construct these scales, we interspersed these questions throughout the other questions on the survey to minimize participant fatigue. These scales have been extensively used in psychology research, including work on consumer behavior, the effects of decision-making on well-being, cross-cultural differences, and/or choice in specific contexts (e.g., health, health care, career, and other lifestyle choices).

The first tool we use is the Melbourne decision-making questionnaire (Mann et al. 1997), which is a 22-item scale to assess an individual's approach to decision making. There are four scales that one can construct from this instrument:

- Vigilance (six questions): a thorough analysis of alternatives. This is most consistent with economist's view of optimizing behavior. As such, we hypothesize that it will be negatively correlated with default behavior;
- Buck-passing (six questions): leaving decisions to others, which we hypothesize will be positively correlated with default behavior;
- Procrastination (five questions): delaying decisions, which we hypothesize will positively predict default;
- Hypervigilance (five questions): an anxious process of hastily settling on an answer, which we hypothesize will negatively predict defaults.

The decision making styles measured by this Melbourne survey are quite relevant to our context, which is complex, multi-alternative, irrevocable, and time limited before being left to the default. Indeed, as Mann et al (1997) discusses, the psychological theory that underlies the Melbourne survey is one in which three conditions influence the choice of coping strategy, each

of which is satisfied by our setting.[11]

We also include a 15-question scale to measure compulsive indecisiveness (Frost and Shows 1993), which is a stable tendency of an individual to avoid making decisions, a natural characteristic to suspect could lead one to default.

To measure the propensity for regret, we us a five-item scale from Schwartz et al. (2002). Our decision context is one in which the alternatives are permanently foregone after one chooses or is defaulted, and thus the potential for regret may be especially salient.

Finally, we use Roets and Van Hiel's (2011) 15-item questionnaire to measure an individual's need for cognitive closure, defined as a "desire for an answer on a given topic, any answer…compared to confusion and ambiguity" (Webster and Kruglanski 1994, p. 1049). The need for closure is believed to be a more stable tendency of an individual, and thus we include this scale to control for that tendency as opposed to a tendency to use a particular decision process (i.e., vigilance or hypervigilance, measured by the Melbourne scale).

V.2 Sample and Summary Statistics

Table 1 shows that of our 6,065 respondents, 27 percent defaulted into the Traditional Plan, whereas 19 percent actively chose the Traditional plan. Of the remaining, 34 percent chose the Portable Plan and 20 percent chose the Self-Managed Plan.[12] Although we rely on SURS administrative data rather than self-reported responses of which plan respondents are in, we note

[11] The authors note "Janis and Mann's (1977) conflict model is essentially a social psychological theory of decision making in which the presence or absence of three antecedent conditions are held to determine reliance on a particular coping pattern. The three conditions are: (1) awareness of serious risks about preferred alternatives, (2) hope of finding a better alternative, and (3) belief that there is adequate time to search and deliberate before a decision is required." (p. 2).

[12] Relative to the full universe of SURS participants who have joined the system since 1999, our sample population under-represents defaulters and over-represents active choosers. This is primarily because those who default into the system are substantially less likely to have an e-mail address on file with SURS, and thus were less likely to be solicited by the survey. Relative to the population of SURS participants who joined the system since 1999 and who had an email address on file, our sample proportions were much closer.

that this sample is knowledgeable about their plan selection. About 92 percent of respondents correctly identified the plan in which they are actually enrolled in the survey. These rates of correct plan reporting are substantially higher than the 77 percent found in Gustman and Steinmeier (2005, Table 2), suggesting that SURS participants are more knowledgeable about their retirement plans than the general U.S. population.

Table 1 also indicates that although the sample is not nationally representative, it is nonetheless diverse in terms of demographics, occupation and economic background. Not surprisingly, given that this system covers higher education, respondents are highly educated, with 62 percent holding a Master's degree, professional degree, or Ph.D. Among the remaining respondents, 10 percent have no post-secondary degree, another six percent have an Associate's degree, and just over 20 percent have a Bachelor's degree. Respondents also come from a range of occupations, with about 13 percent employed as tenured or tenure-track faculty, and 25 percent non-tenure-track faculty. The remaining occupations are spread amongst academic professionals, executives, support staff, and maintenance and public safety personnel. We also have substantial variation in income and household net worth.

Table 2 summarizes the distribution of responses for the decision-making traits that we examine. Recall that every question is asked on a five point scale, with 1 being "strongly disagree" and 5 being "strongly agree." Each measure is the average of the 5-point rating for each of the questions associated with that trait (accounting for reverse scoring of questions that are framed in the negative). Interestingly, the average individual in our sample views themselves as being vigilant, that is, a careful optimizer. The average person disagrees with the characterization of being a procrastinator. Perhaps more important for our purposes, however, is that the standard deviation of responses is between 0.5 and 0.7, which is useful to keep in mind

when evaluating the magnitude of the coefficients below.

VI. Results

VI.1. Factors Associated with the Likelihood of Default

VI.1.1 Psychological Factors

Table 3 provides the results of linear probability models (OLS) with the dependent variable rescaled to 1 if respondents defaulted into the Traditional Plan and 0 if they made an active choice of plan. We have rescaled the coefficients by multiplying them by 100 so that they represent percentage-point changes in the likelihood of defaulting.

Two decision-making traits are significant predictors of default. Individuals who are more prone to procrastination are significantly more likely to default (coefficient = 3.9). Recall that the standard deviation on this variable is 0.7 (on a 5-point scale). Thus, a one-standard deviation increase in this measure of procrastination is associated with a 2.73 percentage point (3.9 * 0.7) increase in the likelihood of default. In other words, a one standard deviation change in the procrastination scale makes one 10 percent more likely to default.

The simplest interpretation is that procrastinators are less likely to get around to signing up, and are thus more likely to find themselves defaulted. Economists, however, tend to view procrastination as being a manifestation of present biased preferences. Present biased individuals put too little weight on time-distant outcomes (in this case, retirement preparedness) relative to the near-term cost of making an active decision.[13] It is worth noting that there are other reasons besides present bias that an individual may procrastinate. One that many academics can related to is simply that of being busy or not having enough time. Thus, as a

[13] For more evidence on how procrastination resulting from present biased preferences affects a range of retirement planning activities, see Brown and Previtero 2014.

simple control, we include a separate question to measure the extent to which one is too busy or in too much of a hurry. The coefficient on this "busy" measure is not significant, nor does it alter the magnitude of the coefficient on procrastination.

Consistent with our hypothesis, we also find that individuals with a stronger need for cognitive closure are less likely to default. Psychologists consider the need for closure to be a reasonably stable trait that is intended to measure how much an individual desires a firm answer and is uncomfortable with ambiguity. In effect, a strong desire to settle on "an answer" is stronger than their desire to get to the "right answer." The coefficient on the need for closure is -4.5. Thus a one standard deviation (0.5 units on the scale as reported in Table 2) leads to a -2.25 percentage point reduction in the likelihood of defaulting, or more than an 8 percent reduction relative to baseline default rates.

Interestingly, the coefficient on vigilance – the one trait that is most closely associated with rational decision making – is not significantly different from zero. Nor are the other measures of decision-making that we included in the survey significant predictors of default behavior.

VI.1.2 Economic and Demographic Determinants of Default

Continuing with Table 3, we find that risk preferences and self-assessed investment skills are significantly correlated with default probabilities. We include two questions to assess risk preferences. The first is modeled on a question used in the Survey of Consumer Finances that asks individuals if about whether they would prefer to take (above/below) average risk for (above/below) average returns. We find a significant pattern of coefficients indicating that less risk averse individuals are less likely to default. This could be because individuals comfortable taking financial risks may be more likely to prefer the defined contribution plan option, which

would require an active choice. However, we also ask a second question based upon the risk aversion questions in the Health and Retirement Survey asking individuals to choose between their current income or a 50/50 gamble between doubling their salary or seeing it cut by a third. Here, we find those most willing to take the gamble are *more* likely to default. Reconciling this offsetting pattern of coefficients in these two questions is admittedly puzzling, and resolving it is beyond the scope of this paper.

Individuals with more confidence in their own investing skills are less likely to default. This could reflect a general level of comfort making financial decisions. It could also reflect the fact that such individuals may be more interested in participating in the defined contribution plan option, which requires an active choice to join.

Individuals who state it is very or extremely likely that they will remain in SURS covered employment for the rest of their career are more likely to default. On the one hand, this is a very counterintuitive finding because people with long expected careers should view this as an even more consequential decision. On the other hand, individuals who expect to spend their entire career in the SURS system would tend to be better off in the Traditional DB plan. Thus, it is possible that these individuals are more likely to be "deliberate defaulters" who understood that this was an appropriate plan and thus economized on decision-making time by allowing themselves to be defaulted.

At the top of the right hand column, we report the coefficient on a question that was intended to control for perceptions of political risk. The poor funding status of public pensions in Illinois is widely known, and thus one might think that greater concern about funding would make one less likely to default into the poorly funded DB. However, active choice does not necessarily protect one from this risk: only the DC option avoids it because both the Traditional

DB and the Portable DB are supported by the same funds. More to the point, nearly three quarters of respondents stated that they were "not at all confident" in the Illinois state legislature, the worst of the categories we provided. In any event, although the coefficient on lacking confidence is negative, it is insignificantly different from zero.

Those with more education are less likely to default. Specifically, those with a Master's or Professional degree are 4.6 percentage points less likely to default, and those with a Ph.D. are 8.3 percentage points less likely to default. Conditional on education, we do not find that measures of financial literacy or having degrees or work experience in finance or business matter. The exception is that individuals who are able to correctly answer basic questions about the SURS system (the approximate share of salary contributed and whether covered by Social Security) are less likely to default. However, we caution against drawing a causal inference because it may be that individuals who chose the defined contribution plan have learned more about these issues during the process of choosing or even after the fact.

Interestingly, women are less likely to default, whereas those with children are more likely to do so. Turning to the continuation of Table 3 on the next page, we also see differences based on occupation, income and net worth. Specifically, we find that higher income and higher net worth individuals are substantially less likely to be defaulted.

Overall, data in Table 3 indicates that the probability of default is inversely related to financial sophistication and wealth. More highly educated participants, those with more confidence in their investment skills, those with more plan-specific knowledge, and those with a higher net worth are all substantially less likely to default. Even after conditioning on these and other factors, however, we find that individual decision-making traits matter.

VI.2.Implications of Defaults: The Subsequent Desire to Switch Plans

VI.2.1 Average Differences by Plan in Desire to Switch

Whether the reliance on default options enhances or detracts from social welfare depends largely on how the default affects the utility of individuals who accept the default relative to whatever action they would have taken in the absence of the default. We are not aware of any research that has attempted to tackle this difficult question directly, nor do we address that issue here because we are unable to vary the default or measure the utility consequences of the various plan choices.

We have a substantially more modest aim, albeit one that is somewhat informative of the deeper issue. At the time of our survey, we ask participants "*If you could go back in time and re-do your original pension choice (assuming the rules when you joined SURS are still in place), which plan would you choose?"* A participant's response allows us to measure whether the participant still views their plan as the best choice as of the time of the survey, or whether they now prefer a different plan. We recognize that this response is not a measure of *ex ante* expected utility at the time of the decision, nor is it an *ex post* measure of derived utility by the end of life. It does, however, reflect the state preferences of the participant at the time of the survey, and as such, it is relevant for assessing respondent's overall satisfaction with the plan choice.

Of course, even if participants wish they were enrolled in a different plan, the reasons they came to this view matter: if personal circumstances changed (e.g., they received tenure, got married, had a change in health status, etc.), then a desire to be in a different plan today does not necessarily mean that the original choice was *ex ante* sub-optimal given the uncertainty at the time. In contrast, if participants learned something about their plans that they should have known at the time of their decision, then there is concern that the default guided participants into

sub-optimal decisions. We analyze these and other factors in more detail later, but we begin with simple tabulations.

In Figure 1, we report the fraction of respondents who would choose the same versus a different retirement plan than the one in which they are enrolled if they were today allowed to re-choose. Across the horizontal axis, we break the sample into defaulters and active choosers, followed by the active choosers split by each of the three plans (Traditional, Portable, and Self-Managed). For each group, we show the fraction that would not choose the same plan (they either name a different plan or state "don't know") and those that would choose the same plan.

The key difference is immediately obvious: three out of every five defaulters would choose a different plan today. This is more than 20 percentage points higher than for active choosers. Of course, such a comparison does not allow us to determine whether it is the act of defaulting that leads to the lower desirability of choosing the same plan, or whether it is the plan itself. Absent the ability to default different people into different plans, this is a difficult decomposition to undertake. Nevertheless, we can go a long way down this path simply by holding the DB plan constant, which we can do by comparing those who defaulted into the Traditional DB to those who actively chose the same Traditional DB plan. Even in this comparison, the difference is about 16 percentage points.

Of course, Figure 1 is based on a rather broad definition of wanting to change plans, as it even includes those who simply "don't know" which plan they would choose today. Figure 2 narrows measure substantially by focusing only on those who would specifically choose a different plan and who state that their desire to do so is strong or extremely strong. We see that nearly 17 percent of defaulters have a strong desire to change plans, whereas just over 7 percent of active choosers have such a strong desire. We can again hold the DB plan constant by

comparing defaulters to those who actively chose the Traditional DB, and we find a very similar difference: nearly 17 percent of defaulters versus only 8 percent of active choosers strongly desire to change plans.

VI.2.1 Correlates of Desire of Defaulters to Switch Plans

Having established that defaulters are more likely to wish to switch plans than active choosers, we now turn to an analysis of individual characteristics that are correlated with the desire of defaulters to switch plans. In Table 4, we limit our sample to respondents who defaulted into the Traditional Plan. The dependent variable is the same as in Figure 1, set equalt to 100 if the individual would not choose the same plan and equal to zero if they would continue to choose the Traditional plan. We run a linear probability model and use the same set of covariates from Table 3 (where we examined who defaulted) in Table 4 to examine the characteristics of defaulters that are associated with the likelihood of wishing to switch plans.

We begin with decision-making traits. Recall that we found that procrastination was correlated in Table 3 with the probability of defaulting. Here, we find that procrastinators who default are significantly more likely to express a desire to switch plans. A natural interpretation of these findings is that procrastinators default not because the traditional plan was the right one for them, but because they never got around to making a choice. As such, they are more likely to subsequently wish they had made an active choice of one of the other plans.

We again find no evidence that vigilance, which we believe is most closely associated with an approach that economists would label as optimizing behavior, is correlated with a desire to switch plans. In contrast we now find that hypervigilance, which is often described in the literature as an impulsive or contrived decision, is correlated with a desire to switch plans. Of

course, there are two plausible pathways for this correlation, which we cannot distinguish in this survey. The first is that the individual made an impulsive decision at the time the choice was made and now, with the benefit of hindsight, wishes they were in a different plan. Alternatively, the individual may simply be making an impulsive decision in response to this survey question, in which case it should not necessarily be interpreted as a case in which the individual would necessarily be better off if they were permitted to switch plans.

We find that "buck-passing" is negatively correlated with a desire to switch plans. Buck-passing is the tendency to leave decision-making to others. We expect that "buck passers" are content having the decision made for them, and thus are unlikely to make an active decision to change the plan in which they are already enrolled.

As with the propensity to default in the first place, we find that a need for cognitive closure is also negatively correlated with a desire to switch plans. This is consistent with an individual not wanting to "re-open" the decision.

We also find numerous demographic and economic controls are correlated with the desire to switch plans. The probability of wishing to switch plans is higher for those who are more tolerant of risk, less likely to stay in SURS for their entire career, and those with less knowledge of the system. Women are 11.3 percentage points more likely than men to wish to change plans. Interestingly, although political risk did not affect the likelihood of default in Table 3, it has a strong effect on the desire to switch plans: those not at all confident in the legislature are 11.5 percentage points more likely to want to switch plans. We find that being high income or high net worth is negative correlated with a desire to switch.

Table 5 conducts a similar analysis but redefines the dependent variable to be equal to 1 only if the person expresses a strong desire to switch to a new plan (whereas the dependent

variable in Table 4 was equal to one if they did not expressly choose to stick with same plan). Again, we find a strong positive effect of procrastination (+4.2) and hypervigilance (+6.2), and a strong negative effect of buck-passing (-5.6). The need for cognitive closure is not significant in this specification. As in Table 4, numerous other covariates are also significant, including risk preferences, investment skills, tenure expectations, political risk, age, net worth, and share of family income accounted for by SURS. A

VI.3 Can a Simple Intervention Overcome Procrastination? A Field Experiment

One of the more robust findings above is that procrastination is associated with a ten percent increase in the probability of default. Further, procrastination also makes it more likely that the individual will subsequently express a (strong) desire to switch plans. This finding is important for thinking about the appropriateness of defaults. In the model of Carroll et al. (2009), for example, default arrangements are inferior to forced choice mechanisms in settings where individuals exhibit procrastination and/or where they have heterogeneous preferences, both of which hold in our setting.

As researchers, we were not in a position to alter the actual default process: this is a statewide public system that requires legislation to alter. However, we were able to work with SURS to implement a much more modest experiment, one specifically intended to address procrastination.

As previously noted, most economic models of procrastination model it as the outcome of a present biased decision maker putting too much weight on immediately salient costs and too little weight on the cost of acting in the future and/or on future consequences. Thus, one natural intervention is to alter the timing of any intervention so that the individual has a greater incentive

to act today. As previously noted, SURS sends enrollment reminders to all new employees who have not made a decision within four months. However, this is still two full months prior to the default date, which gives a procrastinator plenty of time to put off the decision with the intention of getting to it later.

We decided to test for the effect of sending the same reminder letter closer to the default deadline. Thus, for all 5,921 new employees who were eligible to enroll in SURS from July 1, 2013 through February 5, 2014, SURS varied the time period before the employee's pension plan default date at which an enrollment reminder was mailed. Specifically, SURS mailed (on an alternating basis) half of the employees' enrollment reminders about 60 days before their default dates, and the remaining half's approximately 20 days before their default dates. Although we would have liked to have had the reminder even closer to the default date, SURS was understandably concerned about logistical issues (timeliness of mail delivery, call center activity, etc.) and thus we settled on the 20 day window.

Although the sample size is approximately the same as that of our survey, we stress that this was a completely different population. The survey used above was conducted in Fall 2012 among existing employees, whereas our experiment was on new employees enrolling in 2013 and 2014. Thus, we do not have survey information on the new enrollees, although we do have a limited amount of administrative data on the individuals, including whether they are faculty or staff, as well as age. However, because the individuals were randomly assigned to 60 day or 20 day reminders, it is sufficient to simply compare the means of our outcome of interest.

In the sample as a whole, we find that 54.5% of those with a 60-day reminder defaulted, whereas only 53.9% of those with the 20-day reminder defaulted. This difference, however, is not statistically significant.

Looking at various sub-groups, however, we do find statistically significant difference for staff. Specifically, staff members who had the 60-day reminder had a default rate of 53.6%, whereas those with a 20-day reminder had a default rate of 50.8%. This difference of 2.8 percentage points is statistically significant and economically meaningful. Of the 2.8 percent of staff that were induced by the later reminder to make an active choice, about two-thirds of them chose the defined contribution option over the Traditional DB.

Further, we find an even larger effect among staff under the age of 35. Among those in this group, 59.4 percent of those with the 60 day reminder defaulted, whereas this dropped to only 55.6 percent of those with a 20 day reminder. Of this 3.8 percentage points of young staff members that were induced to make an active choice, over 4 out of 5 chose the defined contribution option. Thus, it appears that a majority of the procrastinators who were coaxed into making a choice via a more timely reminder preferred to be in the DC option rather than defaulted into the DB plan.

VII. Discussion and Conclusion

We document significant heterogeneity across the population with regard to sensitivity to defaults. In addition to being influenced by economic factors such as income and wealth, knowledge, and self-assessed investment skills, we also find heterogeneity by psychological traits associated with decision-making. We find an especially robust relation between a general tendency toward procrastination and the likelihood of default. We also find that procrastinators are more likely to subsequently express a desire to be in a different retirement plan than the one into which they were defaulted. Further, we show that a significant proportion of some procrastinators (i.e., staff and younger staff) can be nudged into active choice simply be

changing the timing of the reminder about the enrollment deadline.

We also find significant effects of other psychological traits. For example, those with a strong need for cognitive closure are less likely to default. Hypervigilance and buck-passing are correlated with the desire of defaulters to subsequently switch plans.

The finding that psychological traits such as procrastination are correlated with defaults and the desire to be switch plans is important for assessing the welfare consequences of defaults. If individuals end up dissatisfied with the results of the default, especially in settings like ours where the default is irreversible, this suggests caution in relying heavily on default options as opposed alternatives such as forced choice.

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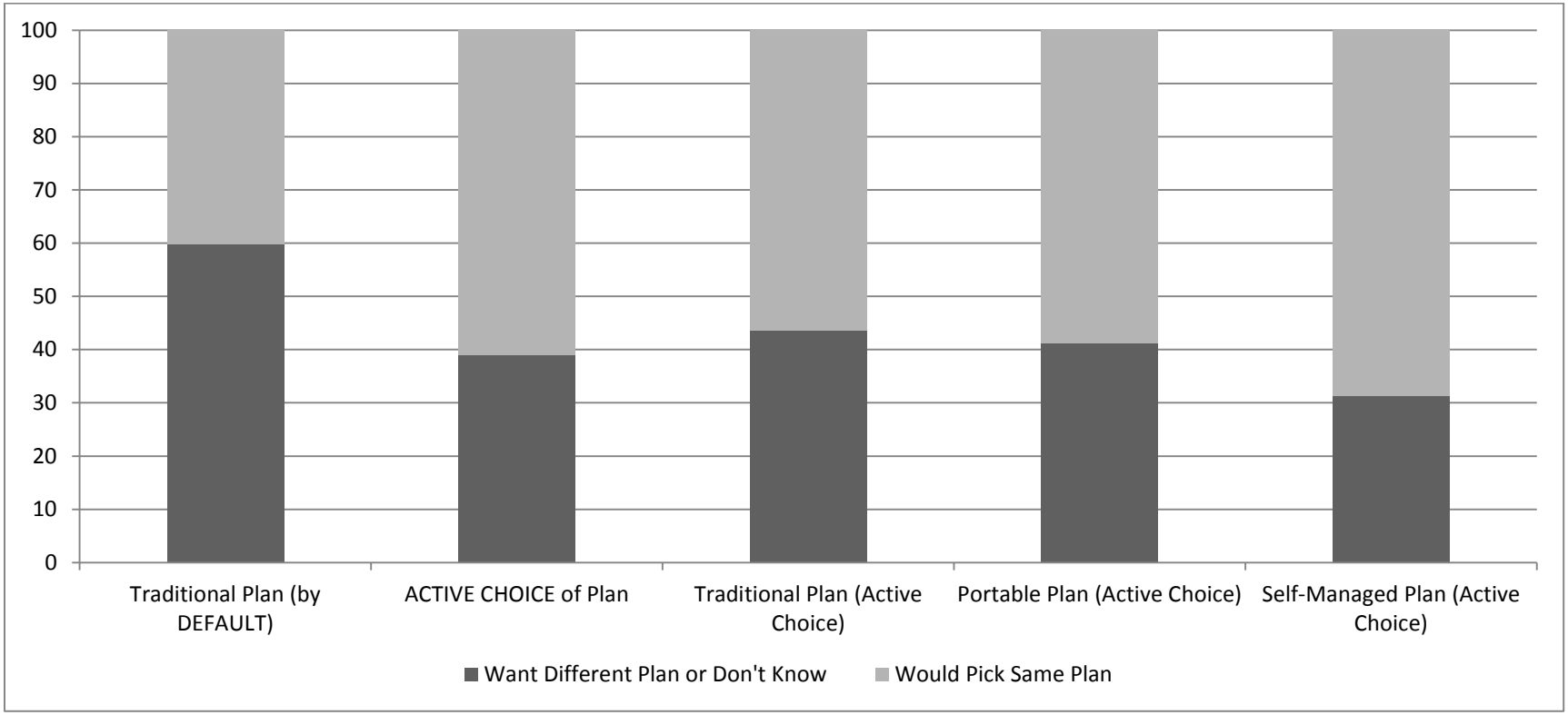
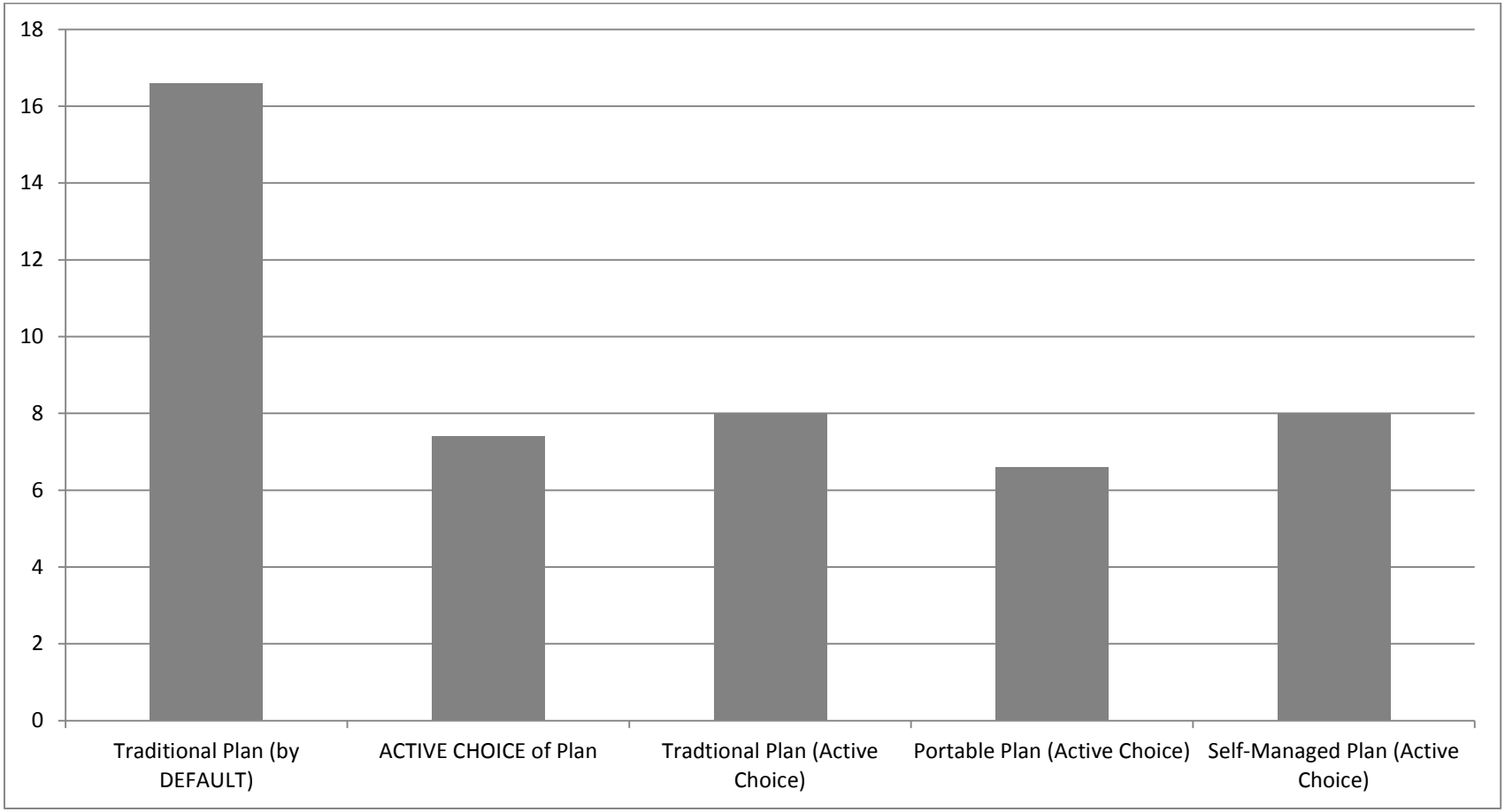
Figure 1: Percent of Respondents Who Would Choose the Same vs. a Different Retirement Plan



Survey respondents were asked, "*If you could go back in time and re-do your original pension choice (assuming the rules when you joined SURS are still in place), which plan would you choose?*" This figure displays the fraction of respondents who would either choose a different retirement plan or don't know which plan they would pick, or would pick the same plan as their original choice. These tabs are calculated separately for those who defaulted and by plan enrollment for those who made an active decision.

Figure 2: Percent of Respondents Who Would Strongly Desire a Different Retirement Plan



Survey respondents were asked, "*If you could go back in time and re-do your original pension choice (assuming the rules when you joined SURS are still in place), which plan would you choose?*" This figure displays the fraction of respondents who would pick a different pension plan and who further indicate a strong or extremely strong desire to re-do the choice. These tabs are calculated separately for those who defaulted and by plan enrollment for those who made an active decision.

Table 1: Summary Statistics for Sample, Percent of Respondents Reported

ACTUAL PLAN ENROLLMENT		**DEMOGRAPHIC CHARCTERISTICS**	
Traditional (defined benefit), by DEFAULT	26.9%	Age (when joined SURS, in years) – mean	48
Active Choice of:		Age (when joined SURS, in years) – 25th %	35
Traditional Plan (defined benefit)	19.0%	Age (when joined SURS, in years) – 75th %	60
Portable Plan (hybrid)	33.6%	Female?	56.8%
Self-Managed Plan (defined contribution)	20.5%	Married?	72.2%
CORRECTLY IDENTIFIED PLAN IN SURVEY		Have children?	67.7%
Full Sample	91.9%	Ranking of health relative to others	
Traditional (defined benefit), by DEFAULT	96.4%	Very poor or poor	2.9%
Active Choice of:		Average	21.4%
Traditional Plan (defined benefit)	97.8%	Good	46.4%
Portable Plan (hybrid)	84.6%	Excellent	29.3%
Self-Managed Plan (defined contribution)	92.8%	**ECONOMIC CHARACTERISTICS**	
RISK PREFERENCE & INVEST SKILL		Occupation	
Risk-Return Tradeoff Preference		Support Staff (secretary)	17.7%
Below average risk and return	15.1%	Executive	1.9%
Average risk and return	65.4%	Academic professional	23.3%
Above average risk and return	19.5%	Faculty (tenured)	3.5%
Take Gamble (50/50, 100% ↑ or 33% ↓)?		Faculty (tenure-track, not tenured)	9.5%
No	62.1%	Faculty (non-tenure track)	25.0%
Yes	18.8%	Police, fire, and public safety personnel	1.5%
Don't know	19.1%	Maintenance and facilities personnel	3.6%
Self-assessment of investment skill		Other	14.1%
Much or slightly worse than others	31.7%	SURS-covered job income	
Same as others	38.5%	Less than $20,000	18.3%
Slightly or much better than others	29.8%	$20,000 to $39,999	23.0%
BELIEF OF HOW LONG STAY IN SURS		$40,000 to $59,999	25.1%
Expected to stay rest of career when joined		$60,000 to $79,999	17.8%
Not at all or slightly likely	50.7%	$80,000 to $99,999	6.8%
Moderately likely	12.5%	$100,000 to $119,999	3.9%
Very or extremely likely	36.8%	$120,000 or more	5.0%
BELIEF OF POLITICAL RISK		Share of family income in SURS-covered job	
Not at all confident in Illinois legislature	71.8%	0-24%	21.5%
Slight or more confidence in Illinois	28.2%	25-49%	20.5%
GENERAL KNOWLEDGE		50-74%	21.7%
Basic financial literacy:		75-100%	36.3%
Correctly answered both questions	43.2%	Household net worth	
Education		Less than $20,000	13.7%
Less than Associate's degree	10.2%	$20,000 to $49,999	11.5%
Associate's degree	6.2%	$50,000 to $99,999	19.9%
Bachelor's degree	21.3%	$100,000 to $249,999	25.3%
Master's or professional degree	42.6%	$250,000 to $499,999	14.1%
Ph.D.	19.7%	$500,000 or more	15.4%
College degree in finance or business?	18.5%	**FOR SAMPLE OF DEFAULTERS: Pick a Different Plan if Can Re-do Today?**	
Work experience in finance?	35.8%	Would stay with Traditional Plan (DB)?	40.2%
SURS-SPECIFIC KNOWLEDGE		Would switch to a diff. plan or don't know?	59.8%
Basic SURS knowledge:		Have a strong desire to switch plans?	16.6%
Correctly answered both questions	59.6%		
		Sample Size of All Respondents	*6,065*
		Sample Size of Defaulters	*1,630*

Table 2: Summary Statistics for Decision-Making Traits and Being in a Hurry

	Mean	S.D.	10th %	25th %	50th %	75th %	90th %
Decision-Making Traits:							
Procrastination	1.9	0.7	1.0	1.2	2.0	2.4	3.0
Vigilance	4.1	0.5	3.5	3.8	4.0	4.3	4.8
Hypervigilance	2.4	0.7	1.6	2.0	2.4	2.8	3.4
Buck-Passing	2.0	0.7	1.0	1.3	2.0	2.3	3.0
Tendency to Regret	2.7	0.7	1.8	2.2	2.6	3.2	3.6
Indecisiveness	2.4	0.5	1.8	2.1	2.4	2.7	3.1
Need for Cognitive Closure	3.1	0.5	2.5	2.9	3.1	3.5	3.7
Busy/Hurry:							
Often do not have time to fully consider options because always in a hurry	2.8	1.1	1.0	2.0	3.0	4.0	4.0

The various measures of decision-making traits are based upon the responses to questions for each trait, with each individual response scored from1 (strongly disagree) to 5 (strongly agree). The decision-making trait score is then the average of responses for the questions pertaining to that trait and thus can vary from 1.0 to 5.0. Specifically, measures of procrastination (5-question index), vigilance (6-question index), hypervigilance (5-question index), and buck-passing (6-question index) are from Mann et al (1997), i.e., the Melbourne Decision Making Questionnaire. The tendency to regret (5-question index) is from Schwartz et al (2002). Indecisiveness (15-question index) is from Frost and Shows (1993). The need for cognitive closure (15-question index) is from Roots and Van Hiel (2011). Finally, our measure for being busy is based on the response to a single question "To what extent do you disagree or agree with the following statement: "I often do not have time to fully consider all of my options because I am always in a hurry", with the response scored from1 (strongly disagree) to 5 (strongly agree).

Table 3: Regression of Whether Defaulted into Retirement Plan Choice, Coefficients from OLS Regression Reported (continued on next page)

DECISION-MAKING TRAITS		**BELIEF OF POLITICAL RISK**	
Procrastination	3.9*** (1.2)	Not at all confident in Illinois legislature	-1.9 (1.4)
Vigilance	0.9 (1.4)	**GENERAL KNOWLEDGE**	
Hypervigilance	-0.9 (1.4)	Basic financial literacy: Correctly answered both questions	-0.0 (1.2)
Buck-Passing	-0.5 (1.1)	Education	
Tendency to Regret	0.4 (1.0)	Associate's degree	-4.6 (3.0)
Indecisiveness	-0.5 (1.8)	Bachelor's degree	-3.4 (2.5)
Need for Cognitive Closure	-4.5*** (1.5)	Master's or professional degree	-4.6* (2.6)
BUSY/HURRY		Ph.D.	-8.3*** (2.9)
Often do not have time to fully consider options because always in a hurry	-0.6 (0.6)	College degree in finance or business?	-2.0 (1.7)
RISK PREFERENCE & INVEST SKILL		Work experience in finance?	1.9 (1.4)
Risk-Return Tradeoff Preference		**SURS-SPECIFIC KNOWLEDGE**	
Average risk and return	-5.0*** (1.8)	Basic SURS knowledge: Correctly answered both questions	-4.5*** (1.3)
Above average risk and return	-9.5*** (2.1)	**DEMOGRAPHIC CHARCTERISTICS**	
Take Gamble (50/50, 100% ↑ or 33% ↓)?		Age (when joined SURS, in years)	-0.10 (0.06)
Yes	3.3** (1.6)	Female?	-2.8** (1.2)
Don't know	-0.3 (1.6)	Married?	-0.6 (1.5)
Self-assessment of investment skill		Have children?	2.7** (1.3)
Same as others	-4.0*** (1.5)	Ranking of health relative to others	
Slightly or much better than others	-5.7*** (1.7)	Average	3.5 (3.6)
BELIEF OF HOW LONG STAY IN SURS		Good	-0.5 (3.5)
Expected to stay rest of career when joined		Excellent	-0.9 (3.5)
Moderately likely	0.2 (1.8)		
Very or extremely likely	6.3*** (1.4)		

Table 3: Regression of Whether Defaulted into Retirement Plan Choice, Coefficients from OLS Regression Reported (continued from prior page)

ECONOMIC CHARACTERISTICS		Share of family income in SURS-covered job	
Occupation		25-49%	-3.3 (2.5)
Executive	-0.0 (4.4)	50-74%	-1.3 (2.6)
Academic professional	-2.4 (2.1)	75-100%	-0.5 (2.6)
Faculty (tenured)	0.5 (3.8)	Household net worth	
Faculty (tenure-track, not tenured)	-5.6** (2.8)	$20,000 to $49,999	-0.9 (2.6)
Faculty (non-tenure track)	5.0** (2.4)	$50,000 to $99,999	-2.6 (2.3)
Police, fire, and public safety personnel	-4.1 (4.9)	$100,000 to $249,999	-5.3** (2.3)
Maintenance and facilities personnel	2.7 (3.6)	$250,000 to $499,999	-9.1*** (2.6)
Other	-0.9 (2.1)	$500,000 or more	-11.1*** (2.6)
SURS-covered job income			
$20,000 to $39,999	-2.3 (2.6)		
$40,000 to $59,999	-2.5 (2.7)		
$60,000 to $79,999	-1.6 (2.9)	*Fixed effects for year of enrollment?*	*Yes*
$80,000 to $99,999	-3.0 (3.5)	*Fixed effects for employer?*	*Yes*
$100,000 to $119,999	-8.0** (3.7)	*Adjusted R-Squared of Regression*	*0.100*
$120,000 or more	-7.3* (3.8)	*Sample Size*	*6,065*

The specification is a linear probability model (OLS) in which the binary dependent variable takes on the value 100 if the respondent defaulted into the Traditional Plan and 0 otherwise. Thus, the coefficients on the explanatory variables are expressed in percentage points.

Standard errors, shown in parentheses, allow for heteroskedasticity.

***, **, * indicates significance at the 1 percent, 5 percent, and 10 percent levels, respectively.

Table 4: Regression of Whether Those Defaulted into Traditional Plan Would NOT Pick Same Plan Today, Coefficients from OLS Regression Reported (continued on next page)

DECISION-MAKING TRAITS		**BELIEF OF POLITICAL RISK**	
Procrastination	4.7* (2.5)	Not at all confident in Illinois legislature	11.5*** (3.0)
Vigilance	1.2 (2.8)	**GENERAL KNOWLEDGE**	
Hypervigilance	6.3** (3.0)	Basic financial literacy: Correctly answered both questions	-0.1 (3.0)
Buck-Passing	-4.1* (2.5)	Education	
Tendency to Regret	3.2 (2.1)	Associate's degree	4.3 (6.1)
Indecisiveness	2.0 (3.8)	Bachelor's degree	6.7 (5.0)
Need for Cognitive Closure	-5.6* (3.0)	Master's or professional degree	0.3 (5.2)
BUSY/HURRY		Ph.D.	0.6 (6.3)
Often do not have time to fully consider options because always in a hurry	1.2 (1.4)	College degree in finance or business?	-4.7 (4.3)
RISK PREFERENCE & INVEST SKILL		Work experience in finance?	1.0 (3.3)
Risk-Return Tradeoff Preference		**SURS-SPECIFIC KNOWLEDGE**	
Average risk and return	1.4 (3.2)	Basic SURS knowledge: Correctly answered both questions	-6.2** (3.0)
Above average risk and return	10.7** (4.7)	**DEMOGRAPHIC CHARCTERISTICS**	
Take Gamble (50/50, 100% ↑ or 33% ↓)?		Age (when joined SURS, in years)	-0.83*** (0.13)
Yes	3.2 (3.5)	Female?	11.3*** (3.0)
Don't know	3.2 (3.6)	Married?	-4.3 (3.1)
Self-assessment of investment skill		Have children?	2.8 (3.1)
Same as others	-4.2 (3.2)	Ranking of health relative to others	
Slightly or much better than others	-2.5 (3.9)	Average	-7.6 (7.2)
BELIEF OF HOW LONG STAY IN SURS		Good	-12.4* (7.1)
Expected to stay rest of career when joined		Excellent	-8.9 (7.3)
Moderately likely	-5.9 (4.4)		
Very or extremely likely	-13.0*** (3.1)		

Table 4: Regression of Whether Those Defaulted into Traditional Plan Would NOT Pick Same Plan Today, Coefficients from OLS Regression Reported (continued from prior page)

ECONOMIC CHARACTERISTICS		Share of family income in SURS-covered job	
Occupation		25-49%	8.3 (5.1)
Executive	-2.3 (12.0)	50-74%	5.0 (5.0)
Academic professional	-6.4 (5.2)	75-100%	3.9 (4.9)
Faculty (tenured)	7.3 (9.0)	Household net worth	
Faculty (tenure-track, not tenured)	6.4 (7.0)	$20,000 to $49,999	-10.8** (5.0)
Faculty (non-tenure track)	3.3 (5.1)	$50,000 to $99,999	-2.7 (4.6)
Police, fire, and public safety personnel	-12.5 (9.1)	$100,000 to $249,999	-5.2 (4.8)
Maintenance and facilities personnel	4.2 (7.5)	$250,000 to $499,999	-6.4 (5.7)
Other	4.8 (4.8)	$500,000 or more	-15.9*** (6.2)
SURS-covered job income			
$20,000 to $39,999	-3.1 (4.8)		
$40,000 to $59,999	-1.2 (5.3)		
$60,000 to $79,999	-0.1 (5.7)	*Fixed effects for year of enrollment?*	*Yes*
$80,000 to $99,999	-2.9 (7.4)	*Fixed effects for employer?*	*Yes*
$100,000 to $119,999	-4.0 (9.4)	*Adjusted R-Squared of Regression*	*0.144*
$120,000 or more	-26.0*** (10.0)	*Sample Size*	*1,402*

The specification is a linear probability model (OLS) in which the binary dependent variable takes on the value 100 if the respondent would not pick the same plan today (either by picking a different pension plan or answering "don't know" to the would you re-do your original pension choice question) and 0 otherwise. Thus, the coefficients on the explanatory variables are expressed in percentage points.

The sample is all respondents that were defaulted into the Traditional Plan.

Standard errors, shown in parentheses, allow for heteroskedasticity.

***, **, * indicates significance at the 1 percent, 5 percent, and 10 percent levels, respectively.

Table 5: Regression of Whether Those Defaulted into Traditional Plan Would Strongly Desire to Switch Pension Plans Today, Coefficients from OLS Regression Reported (continued on next page)

DECISION-MAKING TRAITS		**BELIEF OF POLITICAL RISK**	
Procrastination	4.2** (2.0)	Not at all confident in Illinois legislature	8.0*** (2.2)
Vigilance	2.1 (2.4)	**GENERAL KNOWLEDGE**	
Hypervigilance	6.2** (2.5)	Basic financial literacy: Correctly answered both questions	-1.0 (2.3)
Buck-Passing	-5.6*** (1.9)	Education	
Tendency to Regret	-2.7 (1.7)	Associate's degree	0.7 (4.2)
Indecisiveness	-3.9 (3.0)	Bachelor's degree	6.2 (3.8)
Need for Cognitive Closure	-0.3 (2.5)	Master's or professional degree	-0.6 (3.7)
BUSY/HURRY		Ph.D.	3.4 (4.6)
Often do not have time to fully consider options because always in a hurry	0.4 (1.1)	College degree in finance or business?	4.7 (3.3)
RISK PREFERENCE & INVEST SKILL		Work experience in finance?	-2.4 (2.3)
Risk-Return Tradeoff Preference		**SURS-SPECIFIC KNOWLEDGE**	
Average risk and return	3.5 (2.5)	Basic SURS knowledge: Correctly answered both questions	2.6 (2.3)
Above average risk and return	15.9*** (3.8)	**DEMOGRAPHIC CHARCTERISTICS**	
Take Gamble (50/50, 100% ↑ or 33% ↓)?		Age (when joined SURS, in years)	-0.51*** (0.10)
Yes	4.1 (2.9)	Female?	2.9 (2.3)
Don't know	-2.7 (2.8)	Married?	1.0 (2.4)
Self-assessment of investment skill		Have children?	1.7 (2.4)
Same as others	5.3** (2.5)	Ranking of health relative to others	
Slightly or much better than others	5.3* (3.2)	Average	5.5 (5.2)
BELIEF OF HOW LONG STAY IN SURS		Good	2.3 (5.0)
Expected to stay rest of career when joined		Excellent	7.2 (5.2)
Moderately likely	-2.5 (3.6)		
Very or extremely likely	-7.7*** (2.4)		

Table 5: Regression of Whether Those Defaulted into Traditional Plan Would Strongly Desire to Switch Pension Plans Today, Coefficients from OLS Regression Reported (continued from prior page)

ECONOMIC CHARACTERISTICS		Share of family income in SURS-covered job	
Occupation		25-49%	10.1***
			(3.8)
Executive	-3.0	50-74%	9.2**
	(7.3)		(3.8)
Academic professional	-3.0	75-100%	11.4***
	(4.0)		(3.7)
Faculty (tenured)	4.3	Household net worth	
	(7.2)		
Faculty (tenure-track, not tenured)	-3.6	$20,000 to $49,999	-1.7
	(5.4)		(4.4)
Faculty (non-tenure track)	-0.4	$50,000 to $99,999	-5.0
	(3.8)		(3.9)
Police, fire, and public safety personnel	7.2	$100,000 to $249,999	-4.4
	(8.2)		(4.0)
Maintenance and facilities personnel	9.8*	$250,000 to $499,999	-4.3
	(5.7)		(4.6)
Other	3.5	$500,000 or more	-8.9*
	(3.9)		(4.6)
SURS-covered job income			
$20,000 to $39,999	-1.7		
	(3.5)		
$40,000 to $59,999	-0.2		
	(3.9)		
$60,000 to $79,999	2.0	*Fixed effects for year of enrollment?*	*Yes*
	(4.6)		
$80,000 to $99,999	-0.7	*Fixed effects for employer?*	*Yes*
	(6.1)		
$100,000 to $119,999	1.0	*Adjusted R-Squared of Regression*	*0.116*
	(8.3)		
$120,000 or more	-7.9	*Sample Size*	*1,402*
	(7.4)		

The specification is a linear probability model (OLS) in which the binary dependent variable takes on the value 100 if the respondent would strongly desire to switch to a different plan and 0 otherwise. Thus, the coefficients on the explanatory variables are expressed in percentage points.

The sample is all respondents that were defaulted into the Traditional Plan.

Standard errors, shown in parentheses, allow for heteroskedasticity.

***, **, * indicates significance at the 1 percent, 5 percent, and 10 percent levels, respectively.

APPENDIX Table 1: Regression of Whether Those Defaulted into Traditional Plan Would Stongly Desire to Switch Pension Plans Today, Potential Deliberate Defaulters Dropped, Coefficients from OLS Regression Reported (continued on next page)

DECISION-MAKING TRAITS		**BELIEF OF POLITICAL RISK**	
Procrastination	5.8** (2.7)	Not at all confident in Illinois legislature	8.3** (3.3)
Vigilance	4.4 (3.3)	**GENERAL KNOWLEDGE**	
Hypervigilance	6.1* (3.4)	Basic financial literacy: Correctly answered both questions	-1.4 (3.2)
Buck-Passing	-6.3** (2.7)	Education	
Tendency to Regret	-5.0** (2.3)	Associate's degree	0.0 (6.1)
Indecisiveness	-6.0 (4.4)	Bachelor's degree	3.2 (5.1)
Need for Cognitive Closure	2.7 (3.8)	Master's or professional degree	-1.2 (5.2)
BUSY/HURRY		Ph.D.	3.8 (6.6)
Often do not have time to fully consider options because always in a hurry	0.6 (1.6)	College degree in finance or business?	10.4** (4.8)
RISK PREFERENCE & INVEST SKILL		Work experience in finance?	-3.4 (3.4)
Risk-Return Tradeoff Preference		**SURS-SPECIFIC KNOWLEDGE**	
Average risk and return	4.4 (3.8)	Basic SURS knowledge: Correctly answered both questions	7.9** (3.5)
Above average risk and return	21.1*** (5.7)	**DEMOGRAPHIC CHARCTERISTICS**	
Take Gamble (50/50, 100% ↑ or 33% ↓)?		Age (when joined SURS, in years)	-0.50*** (0.14)
Yes	2.2 (4.1)	Female?	2.3 (3.3)
Don't know	-3.0 (4.2)	Married?	4.8 (3.4)
Self-assessment of investment skill		Have children?	2.4 (3.5)
Same as others	8.0** (3.5)	Ranking of health relative to others	
Slightly or much better than others	10.6** (4.6)	Average	6.8 (8.0)
BELIEF OF HOW LONG STAY IN SURS		Good	4.3 (7.9)
Expected to stay rest of career when joined		Excellent	9.0 (8.0)
Moderately likely	-4.8 (5.1)		
Very or extremely likely	-6.1* (3.5)		

APPENDIX Table 1: Regression of Whether Those Defaulted into Traditional Plan Would Strongly Desire to Switch Pension Plans Today, Potential Deliberate Defaulters Dropped, Coefficients from OLS Regression Reported (continued from prior page)

ECONOMIC CHARACTERISTICS		Share of family income in SURS-covered job	
Occupation		25-49%	14.5*** (5.6)
Executive	-0.6 (14.3)	50-74%	15.7*** (5.5)
Academic professional	-0.8 (5.8)	75-100%	23.6*** (5.7)
Faculty (tenured)	4.3 (10.2)	Household net worth	
Faculty (tenure-track, not tenured)	-6.3 (7.5)	$20,000 to $49,999	-1.6 (5.8)
Faculty (non-tenure track)	-0.3 (5.3)	$50,000 to $99,999	-3.7 (5.6)
Police, fire, and public safety personnel	18.7 (14.4)	$100,000 to $249,999	-6.9 (5.9)
Maintenance and facilities personnel	7.4 (8.1)	$250,000 to $499,999	-2.2 (6.8)
Other	4.4 (5.4)	$500,000 or more	-11.1* (6.8)
SURS-covered job income			
$20,000 to $39,999	-1.4 (5.2)		
$40,000 to $59,999	-6.7 (5.7)		
$60,000 to $79,999	-1.7 (6.5)	*Fixed effects for year of enrollment?*	*Yes*
$80,000 to $99,999	-2.3 (9.4)	*Fixed effects for employer?*	*Yes*
$100,000 to $119,999	-2.7 (12.1)	*Adjusted R-Squared of Regression*	*0.181*
$120,000 or more	-5.4 (12.7)	*Sample Size*	*876*

The specification is a linear probability model (OLS) in which the binary dependent variable takes on the value 100 if the respondent would strongly desire to switch to a different plan and 0 otherwise. Thus, the coefficients on the explanatory variables are expressed in percentage points.

The sample is all respondents that were defaulted into the Traditional Plan, excluding those that answered "I would have selected the Traditional Plan anyway" was a very or extremely important reason why they defaulted.

Standard errors, shown in parentheses, allow for heteroskedasticity.

***, **, * indicates significance at the 1 percent, 5 percent, and 10 percent levels, respectively.