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Is it really good to annuitize?☆

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ABSTRACT

Although rational consumers without bequest motives are better off investing exclusively with annuitized instruments in partial equilibrium, we demonstrate the welfare effect of annuitization is ambiguous in general equilibrium on account of pecuniary externalities. Absent institutional constraints like prices and budgets, the optimal consumption rule would have marginal utility increase at the preferential discount rate. In a rational competitive equilibrium where households fully annuitize, the growth rate of marginal utility will be the discount rate minus the interest rate, resulting in a consumption profile that is too flat. Accidental bequests transfer wealth from the old to the young, steepening the consumption profile and yielding a better equilibrium. If households are restricted to Keynesian consumption functions, the optimal irrational equilibrium with standard preferences can replicate observed consumption and macroeconomic behavior, and the equilibrium without annuities delivers higher utility than the equilibrium with annuities. Whereas preceding papers have merely hypothesized that households might engage in socially optimal, yet irrational behavior, the failure of households to annuitize is a real-world example of this. Policymakers should not take steps to encourage more annuitization by the public.

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Annuities, i.e. investment instruments that pay an income stream that terminates upon the owner's death, present a puzzle to economists. In their optimal format, annuities perfectly insure against longevity risk by giving surviving investors, on top of the ordinary return to capital, a premium that increases with the probability of dying.¹ Deceased investors surrender their investment, and these assets are used to pay the premiums of surviving investors. Without bequest motives, rational

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¹ In practice, a financial intermediary will do the actual work of maintaining assets that finance the recipient's consumption stream. Frictions in the annuities market will reduce the effective return on annuities and the consequent consumption stream. See Sheshinski (2008) for a review of the general theory of annuities.

households are indifferent to the disposal of their assets after death. Since annuities earn a higher return, such households should invest all their wealth in annuities (Yaari, 1965). Even households with bequest motives ought to annuitize the wealth intended to finance their own consumption. Nevertheless, private annuity investments account for only 1% of total household wealth for households over age 65 in the United States,² and only 6% of households in this age range participate in private annuities (Pashchenko, 2011). Although many researchers believe the near total rejection of annuities by the public can be explained if all relevant frictions are properly accounted for, this stylized fact remains a difficult challenge for the rational-expectations paradigm.³ Moreover, even if one finds that annuities products available to the public today are not attractive to rational agents, this does not explain why the annuities market is so thin to begin with when, theoretically, the demand ought to be so large.

We consider the issue in a different light. Most of the literature on the annuities puzzle is motivated by the presumption that people hurt themselves when they fail to annuitize. In the basic partial-equilibrium model of Yaari (1965), this is certainly true from the perspective of a single individual, but is it true for society as a whole in general equilibrium? If agents behave rationally, the answer is ambiguous, depending on the parameterization of the model, though for our baseline calibration welfare will be higher if households do not have access to annuities.⁴

If we expand our focus from individually rational behavioral rules to any behavioral rule consistent with market-clearing constraints, the answer is more straightforward.⁵ There will generally exist a market-feasible consumption rule employing nonannuitized investments that confers higher lifetime utility than the corresponding rational equilibrium with full annuitization while maintaining the same capital stock. In the framework of optimal irrational behavior (Feigenbaum et al., 2011), the optimal consumption and saving rule in an economy with accidental bequests, as opposed to annuities, can nearly achieve the maximal welfare of the Golden Rule without extramarket transfers of consumption. Such a high capital stock is obviously counterfactual. However, the optimal consumption rule under bequests continues to yield higher utility than the optimal rule with annuities if we restrict households to Keynesian rules more consistent with actual consumption and saving data.

These unintuitive findings are a consequence of “pecuniary externalities” (McKean, 1958; Prest and Turvey, 1965): in decentralized economies people’s actions are affected by prices and other variables, which are themselves determined by the aggregate behavior of the people. Although this two-way causal relationship is the centerpiece of modern economics, economists generally assume that households take prices as given and ignore the effect their actions have on prices. It is this assumption that gives rise to pecuniary externalities.⁶ The Welfare Theorems prove this is an innocuous assumption in infinite-horizon, representative-agent models for which Pareto optimality is equivalent to welfare maximization. However, this equivalence does not hold for overlapping-generations models, even when competitive equilibria are Pareto optimal, because there are multiple agents. Recent work (Feigenbaum and Caliendo, 2010; FCG, 2011) has shown that welfare can be improved in the steady state, without extramarket transfers of consumption, if different cohorts coordinate their consumption and saving behavior across generations to exploit pecuniary externalities.⁷

In the present context, we see an analogous result applies to portfolio allocation rules that apportion savings between annuities and nonannuitized investments. In a general equilibrium, households will receive a bequest that must be equal in value to the wealth bequeathed to them. Under the rational paradigm, households will choose their portfolio of annuities and nonannuitized investments to maximize their utility while treating the value of the received bequest as a given. Since annuities earn a higher return, households will only invest in annuities, and in equilibrium the received bequest will be zero. However, the best feasible consumption allocation will have the marginal utility of consumption increase over the lifecycle at the preferential discount rate. Except for an equilibrium that coincides with the Golden Rule allocation, so the interest rate is zero, this will differ from a rational competitive equilibrium, in which marginal utility increases at the rate of the discount rate minus the interest rate. If the equilibrium is dynamically efficient and interest rates are positive, the best feasible consumption allocation will be steeper than the rational competitive equilibrium. Transfers of consumption from

² This is according to the 2000 Health and Retirement Study (Johnson et al., 2004). Social Security and defined benefit pension plans are not accounted for here, though they are effectively annuities, albeit suboptimal annuities that do not provide the intracohort risk-sharing benefits of financial annuities (Guo et al., 2012). Transaction costs and borrowing constraints may deter poor households from reoptimizing portfolios involving Social Security, but this cannot explain why so few wealthy households do so.

³ Davidoff et al. (2005) and Leung (2010) show that the management costs of annuitization would have to be huge to prevent households from annuitizing a substantial portion of their wealth. Reichling and Smetters (2012) show that if mortality probabilities are themselves stochastic, incomplete annuitization could be optimal if households are sufficiently impatient or if income shocks are correlated with mortality shocks. See Pang and Warshawsky (2009), Lockwood (2012), and Pashchenko (2011) for estimates of how much annuitization will occur in lifecycle models with frictions.

⁴ Heijdra et al. (2010) have also found this in a two-period overlapping generations model. They focus on the transition path that follows the opening of perfect annuities markets whereas we focus on explaining why households have selected an equilibrium where they do not annuitize.

⁵ There is no annuities puzzle if households are not required to be fully rational. See Brown (2007), Hu and Scott (2007), and Milevsky and Young (2007).

⁶ Pecuniary externalities are not externalities in the standard sense of the word used by economists. Indeed, the term is an oxymoron if we strictly adhere to the definition that an externality is an interaction that happens outside of markets since these externalities only arise in the context of a market. Mathematically, however, their effects are analogous to a standard externality in that the class of equilibria where households ignore a pecuniary externality is a subset of the class of equilibria where they may consider it. Consequently, the best equilibrium where they ignore a pecuniary externality confers (weakly) lower utility than the best of all possible equilibria.

⁷ Early generations will be hurt when this coordination is implemented, so this finding does not contradict the Pareto optimality of dynamically efficient competitive equilibria. See Molina-Abraldes and Pintós-Clapés (2008) for more on the Pareto optimality of competitive equilibria in continuous-time overlapping-generations models.

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