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Keywords

Digital investment advice, decumulation strategies, investing in retirement, payouts, robo-advisor

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Comments

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Digital investment advice providers have traditionally focused on the process of assets accumulation. But as Baby Boomers and Gen Xers age, they will need to shift from accumulation to decumulation, and there is less agreement about how to manage payouts during retirement. This chapter provides on overview of digital investment advice in the U.S., explores how digital advice providers are thinking about and executing decumulation strategies, identifies challenges they face, and discusses how these decumulation strategies could affect investors.

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As the Baby Boomers retire and pivot to generating an income in retirement, many of them will seek easy and inexpensive ways to manage their investments to this end. Whether digital investment advice providers, often called 'robo-advisors' or 'robos,' can meet this need is the subject of our chapter. We begin with a brief overview of the development of digital investment advice services, followed by a review of the challenges of asset decumulation in retirement, many of which apply to both traditional and robo-advisors. Yet because robos operate primarily in a realm of electronic communications, they face a number of unique demands. Next we briefly describe discuss the issues with which digital advice providers wrestle as they try to provide decumulation services for their clients; and end by discussing implications for the robo marketplace.

A Brief History of Automated Financial Advice

Technology has played a major role in driving development of the financial services industry in the US for hundreds of years. In the 19th and early 20th centuries, trades were entered longhand into a New York Stock Exchange ledger. Electronic tickers then replaced ledgers, and in the early 1960s, Bunko Ramo Corporation developed a computerized quote system that laid the groundwork for the introduction of the automated, high-speed markets we know today. Advances in technology also led to advances the types of investment tools available to financial advisors.

Beginning in the early 2000s, several firms offered a variety of online, client-facing tools that presaged some of the functionality available through today's robos (Ameriks 2001; Agnew 2006). Broadly speaking, those tools provided two main elements: (1) limited financial or investment planning functionality, such as calculators and budgeting tools to assist investors in determining how much they need to save for a particular goal or objective within a timeframe (e.g., retirement or purchase of a new home in five years); and (2) asset allocation tools, frequently

provided by online broker-dealers to their clients to help investors determine how to allocate their investments based on their investment profiles. Beyond that, some online broker-dealers offered additional tools to assist self-directed investors in screening or filtering securities.

In the aftermath of the 2008-2009 financial crisis, a new type of investment intermediary emerged: the client-facing digital investment advisor or robo-advisor. As the industry has developed, some firms offered robo service directly to consumers, while others offered their product on a white-label basis through a third-party advisor and/or employer-provided retirement plans. Some did both.

Robos typically ask customers a limited set of questions about their investment objectives, investment time horizon, and risk tolerance, as well as other questions, and then process the responses through algorithms to profile the investors and place them into low-cost portfolios, usually made up of exchange-traded funds (ETFs; see FINRA 2016). In addition, some robos offer portfolio rebalancing and tax loss harvesting functionality. In their earliest incarnations, the robo-advisors typically did not provide access to a human investment advisor. As will be discussed below, this has changed, and many robos now offer access to a technology help desk and, typically at additional cost, to a human advisor.

Of course, digital functionality is by no means new to the securities industry. Sophisticated resources have long been available to the professional advisory community, often in the form of proprietary ‘in house’ services that run simulations, customize portfolios, and more. What has changed is that this functionality is becoming available directly to retail investors in a simplified, accessible form. Moreover, advisory firms have long used investment models, Modern Portfolio Theory, and other models seeking to reassure investors that their services were rigorous.

Despite the common academic foundation driving investment advice, it is clear that robo portfolios can differ, even for a given investor (Polansky and Sibears 2016; Deschenes and Hammond 2019). Further, there is no generally accepted investment methodology around which firms can anchor their approaches to decumulation.

Why Generating Retirement Income Is a Challenge

Many Americans have a difficult task before them, and so do financial advisors seeking to offer decumulation services: it is not simple to generate a stable retirement income stream. For one reason, people may need to generate income from several employer-based retirement accounts, individual retirement accounts (IRAs), traditional defined benefit pensions, taxable investment accounts, and savings accounts, all of which may be held by different financial institutions. Retirees must also consider their social security options, since deciding when to claim social security benefits is affected by a number of behavioral factors and can have a considerable impact on retirement income (Knoll 2011). There is also the question of whether to tap home equity (if any exists). Tax treatment of retirement income is yet another factor retirees must consider: taxes vary depending on the type of account or investment tapped for retirement income, the amount received, and other factors.

Complicating matters further, people must make a number of important assumptions when planning their retirement incomes. These include inflation rates, equity returns, bond returns, expected health in retirement, and life expectancy—assumptions that, if wrong, could impact the quality of life people experience in their later years.

Equally importantly is the matter of how much risk a retiree can take. Lifecycle funds and other products that automatically rebalance generally involve increasingly lower levels of risk over

time (reducing exposure to stocks, for instance, and increasing exposure to bonds and cash). At the same time, some older investors may feel a need to take on additional risk in the hope of catching up if they lack sufficient funds for retirement. This can lead to practices such as 'yield reaching' or, worse, make them vulnerable to financial fraud. Several studies have, in fact, found an association between risk taking and fraud susceptibility, as well as debt and fraud susceptibility (Kieffer and Mottola 2017; Kircanski et al. 2018).

As a result, generating a retirement income by decumulating assets is arguably more difficult than accumulating assets destined for retirement. The accumulation phase involves fewer and less complex decisions, and there are often opportunities to course-correct along the way. Further, during the accumulation phase, the entire process—enrollment, fund selection, savings rate, and escalation of the savings rate—is often automated, requiring fewer decisions for the employee. For example, Vanguard (2017) reported that nearly half of the plans they administer offer automatic enrollment, covering 61 percent of their participant population.

Generally speaking, accumulation portfolios for clients have different levels of equity and fixed income exposure as well as risk (Polansky and Sibears 2016), yet most of them operate within the generally-accepted modern portfolio framework. There is little agreement among investment professionals about how best to decumulate assets, and few academic studies exist to guide investors and investment professionals through the decumulation phase.[1] Accordingly, without an agreed-upon decumulation methodology, investors may be exposed to greater variation in advisor approaches and strategies that may lack a sound basis. For example, one common maxim is the 'four percent rule,' which proposes that retirees withdraw four percent of their assets each year to avoid running out of money during retirement. Yet this is an overly simplistic rule that can result in asymmetric risks, leading to the serious problem of overspending in retirement, causing money

to run out before death (Finke et al. 2013). Alternatively, it can result in underspending in retirement, leaving more assets at death than planned (Fellowes 2017). Other approaches include the use of annuities, bond ladders, interest-only withdrawals, longevity insurance, managed payout funds, or a combination of some or all of these.

Those facing the decumulation process may also fall prey to certain biases that negatively affect their financial decision-making. For example, overconfidence, loss aversion, mental accounting, the disposition effect, framing, anchoring (Byrne and Utkus 2013), choice overload (Iyengar and Lepper 2000), the certainty effect (Kahneman and Tversky 1979), emotions (Kircanski et al. 2018; Frydman and Camerer 2016; FINRA Foundation 2014) and impulsivity control (Knutson and Samanez-Larking 2014) all influence peoples' financial behavior. Additionally, some people cannot understand and use probabilities to make decisions, further impeding effective financial decision-making (Gigerenzer 2002).

For these reasons, some people seek financial advice where the level of service and personalization depends on their means, typically measured in assets. Wealthy retirees can afford to use traditional financial advisors who provide one-on-one personalized advice, financial plans, and tools to guide a client's investing and spending in retirement. Even here, however, some financial planners lack the technology and expertise to provide comprehensive advice on key decumulation decisions like Medicare or social security claiming, or they do not run simulations to evaluate how to optimize these and other decisions in concert with an investment plan. Retirees with fewer assets typically have fewer options, since lower balance accounts often are not cost-effective for traditional financial advisors. Yet our discussions with robo firms indicate that this clientele is potentially ripe for robo-advice platforms.

Lessons from Industry Interviews

To delve further into the state of play in the robo-economy, we conducted interviews with more than a dozen representatives from digital investment advice providers, financial services companies, a data aggregation company, and members of an investor issues group organized by a leading consumer advocate. This last group consisted of investor advocates and securities industry representatives tasked with discussing important marketplace and policy issues in an off-the-record setting. We also interviewed a journalist who writes on retirement income issues. These interviews were conducted by phone, in person, and in writing, during the fourth quarter of 2017 and the first quarter of 2018. Where possible, we confirmed our findings with articles on or related to this topic.

Several questions guided our talks with robo-advisors, other industry participants and (with slight variation) consumer advocates: (1) How would you describe the state of robo-advisors and their decumulation strategies? (2) What business challenges do robos face related to decumulation? (3) Beyond robo-accumulation functionality, what other functionality do robos need to offer in order to provide advice on decumulation? (4) What additional information, beyond that which they collect for the accumulation phase of investing, do they need from the client in order to execute a decumulation strategy? (5) Is there agreement among robo-providers on the types of additional information they need to obtain from their clients for the decumulation phase? (6) Are there generally agreed upon approaches within the industry broadly for decumulating assets and, if so, do you see robos adopting these approaches for decumulating assets? (7) Do you see a 'pure robo' model as workable, or do the complexities of retirement planning require some level interaction with a human advisor? If the latter, are there key points where human intervention is needed? (8) What disclosure information should clients receive about the decumulation strategy that the robo provides? (9) What consideration, if any, are robo providers giving to cognitive decline

experienced by clients using their decumulation services? (10) What role, if any, do you see human advisors playing in association with a robo provider's decumulation plan? (11) Are there other questions we should be asking/issues we should be looking into? Regarding the last question, no interviewees suggested additional areas or topics we should consider. Interviewees were told that no comments or insights would be attributed to them individually unless we obtained their permission, and that their organizations would be listed in the Acknowledgements section unless they did not want it listed. Interviewees had the opportunity to review a draft article and provide feedback prior to publication.

The target market. Most of the robo-advisors identified Millennials as a key target market, but they also indicated that they served a broader group including substantial Generation X and Baby Boomer customers, including some who were retired or close to retirement. Investors interested in using robos tended to have: (1) comfort using technology-based solutions with minimal or no human interaction; (2) insufficient funds for a traditional advised financial relationship; (3) lack of interest in and possible distrust of, traditional financial intermediaries; (4) a do-it-yourself attitude (i.e., they were interested in managing their investment process broadly, but not to the extent of constructing, managing, and rebalancing their portfolios); (5) confidence in passive, index-driven investment strategies possibly accompanied with a lack of confidence in the value of actively managed investment strategies and/or traditional financial advisors; and (6) a desire for a relatively simple, fully or substantially 'packaged' investing solution. A related factor was the desire for paying low management fees.

Mainstream robo-advice tends to be targeted at investors who do not engage in active trading nor are the interested in developing/implementing their own investment theses. Moreover, these investors tend to prefer a passive, index fund-based approach to investing, though some robos

do target investors seeking more active management. Generally, robo providers expect that the investor will accept an 'off the rack' portfolio, and while investors may have some discretion to adjust their profiles to be placed in more or less aggressive portfolios, robo-firms anticipate that this is done infrequently. In addition, investors usually have limited or no choice in selecting the securities used to build their portfolios.

Some discussions cast investors' advice needs in binary terms: no advice/full do-it-yourself all the time vs. fully advised all the time. Those with whom we spoke generally thought that investors' real-world needs were more nuanced. Some investment decisions are less complicated or less consequential, while others are more complex and may have far-reaching consequences, including some that cannot be easily adjusted. The former may lend themselves to simple, online solutions, while the latter may require more time and consultation with the investor, whether through online interaction and education or direct contact with a human advisor. Accordingly, robo business models are evolving to provide multiple levels of service at different price points, to help address these differing needs.

Some observers view robos as a democratizing force that can make high-quality financial advice available to a broad base of investors, many of whom lack sufficient assets to be attractive to many traditional brokerage and advisory firms. Cerulli and Associates (2017) reported 101 million US households have less than $250,000 in investible assets each, and 75 million of them have less than $50,000 in investible assets. Based on the feedback we received, robo-advisors appear well positioned to meet some of the needs of such investors. One caveat here is that investors with complicated financial situations, regardless of their level of investable assets, may require higher levels of advice.

Industry evolution. Robo advice is still a relatively new facet of the securities industry, and the players are evolving rapidly as they seek to gain a foothold in a highly competitive marketplace. Competition from new entrants, existing robos, and incumbent traditional financial firms is likely to drive continued innovation, while also amplifying forces that may drive both consolidation and fragmentation in the market. We anticipate that there will be innovation at each point along the existing advice value chain, and that some firms will add to the value chain by developing tools to support decumulation. Developments in the market for robo services may also be influenced by developments in the 'near robo' space, such as firms in adjacent financial services areas like broad financial planning. In this situation, the landscape of players is likely to become more complex, and the definition of what constitutes a robo will likely remain in flux.

A changing robo landscape. Most robos provide investment advice within the context of a client's single investment account, (i.e., the advice is limited to the account at the robo and does not factor in investments held elsewhere). Some firms are considering providing tools that take into account the totality of a client's investment accounts. In at least some cases, those firms offer the planning and advice service as a standalone service or through a Registered Investment Advisor (RIA).

While most robos we reviewed focus on general investment advice, some concentrate on a specific market niches or segments. Most notably for this article, one provides services specifically focused on the needs of individuals entering, or already in, retirement. Although not focused on decumulation, others did offer automated advice for 401(k) account holders.

In their early days, robo-advisors generally offered a service based on recommendations generated by the systems' algorithms and with limited opportunity for human interaction outside of tech support and account opening processes. As robo advice has developed, a number of firms

now deliver tiered offerings where, for a higher fee, the firm can provide greater access to human advisors and more customized advice. As technology continues to advance, for example through the development of artificial intelligence techniques, robo-advisors may harness these advances to extend their service offerings. These advances may include functionality that would allow automated systems to handle the more complex situations individuals may face as they enter retirement.

A View from the Industry

Next we identify contextual considerations or factors affecting the interactions between advisors and investors entering or in retirement.

Context and considerations. Moving from asset accumulation to asset decumulation marks a significant transition for both investors and advisors, and one that has major implications for the functionalities advisors may need to provide and the modes through which they deliver advice.

For investors, this change is typically characterized by increased uncertainty, the need to make point-in-time, highly consequential decisions, and limited or no experience upon which to draw to make these decisions. During the accumulation stage of their lives, investors face some uncertainties (e.g., potential serious health problems or loss of employment), but uncertainty increases significantly as people enter retirement. Investors do not know, for example, how long they will live, what their health situation will be, how they will want to spend their time, and the financial demands they will face. Moreover, individuals have decades to 'learn by doing' in their investments with the opportunity to learn from mistakes, and in many cases to substantially correct those mistakes. Instead, investors need to make important financial decisions with limited or no previous experience facing these questions and little or no opportunity to correct mistakes.

As a consequence, the transition likely requires a substantial change in the ways investors interact with their advisors (robo, human, or hybrid), moving from a largely passive role, to active engagement with the advisor as the investor enters or moves through retirement. Key questions and issues include, for example, whether and when to purchase an annuity, or if an individual has a pension, whether to take a lump sum payment or an annuity, and when to start drawing social security (at retirement or a later date), among others.

From an advisory perspective, the informational needs to advise an individual on retirement financial planning increase significantly. Today, most robos advise on the assets they manage, and some robos can manage those assets within the context of an individual's broader portfolio, that is, assets the investor may hold elsewhere. Many interviewees noted that effective financial planning for retirement, however, requires a far broader view of the retiree's circumstances, to include not only a full view of the retiree's assets (e.g., potential social security and pension income) and liabilities (e.g., mortgage) but a number of other quantitative and qualitative factors, as well. For example, an advisor would benefit from understanding an individual's personal and family health history. If the retiree is married or has a partner, information about the partner's financial and health information would also be helpful. Finally, as noted above, individuals frequently do not know how they will spend their time during retirement, and how they spend their time typically changes with age.

There are some rules of thumb to guide decumulation, like the four percent rule, but these are not rooted in rigorous empirical analysis and most of the individuals we interviewed believe that the rule is inadequate. Instead, the firms we interviewed that did provide at least some level of service focused on approaches that reflected their own analysis and philosophical approach to decumulation. For example, some used low-risk, more liquid investments to provide a base level

of income sufficient to meet a retiree's basic needs, and higher-risk investments to address optional desires such as travel or purchase of an additional house.

Robo focus on decumulation. While most of our discussions with robo-advisors reinforced the view that robos today focus on attracting investors and assets for the accumulation stage, aspects of some of these firms' product or service offerings are relevant to decumulation. For example, one firm offers an automatic withdrawal feature that investors can turn on and off. The firm also offers a more sophisticated approach to drawdowns that incorporates considerations related to required minimum distributions (RMDs), but this option requires an investor to use the firm's hybrid advisory service. Another firm noted that it has a heritage of working with 'do-it-yourself' oriented customers and offers them income-oriented portfolios and tools to project a sustainable withdrawal rate and track withdrawals against that rate. These tools are, however, best-suited for individuals with simple financial pictures. That firm also offers a hybrid robo service to address more complex questions, such as determining the sequencing of withdrawals from taxable and non-taxable accounts.

We also met with a company that focuses almost exclusively on decumulation. This firm offers three service tiers: free, self-service, and full-service. The self-service tier is essentially a robo for decumulation; that is, it offers clients a fully digital interaction, while the full-service tier combines both technology-based advice and access to a human advisor. The higher level service tiers have increasing account minimums and fee levels. This firm's decumulation-oriented services include account sequencing (i.e., advice on the order in which retirees should draw on their accounts), social security optimization, and health spending plans.

Target market. In an increasingly crowded market, some robo-advisors continue to pursue a broad range of potential investors, while some are taking a more targeted approach. The targeted

approach may be reflected in marketing, as well as service or product offerings. At the broadest levels, robos are often characterized as a tool for Millennials; however, a number have a fairly broad age range of clients, including Generation X and Baby Boomer clients. At one firm, for example, 30 percent of clients are over 50.

Sometimes firms target specific markets based on demographic factors, investment objective, or investing styles. For example, one robo targets women, while some others invest only in securities that meet specific ethical or social interests such as Halal or socially responsible investing. Still other robos differentiate themselves through their investment style and/or product offerings. While many firms utilize passive investment strategies, others take a more active approach to their investment strategies or may offer a broader range of investments. For example, one firm engages in tactical asset allocation using ETFs, while another offers, among other things, a 'core-satellite' investing approach (offering ETFs and other mainstream securities products), along with access to bitcoin and venture capital investments, products not typically offered at other robos.

How much human involvement does retirement planning require? Many individuals we interviewed subscribed to the notion that the degree of human intervention required for decumulation is a function of two factors: (1) the complexity of the individual's financial situation; and (2) the degree of reassurance the individual may need around particular investment-related decisions. Some interviewees agreed that, currently, a purely robo-based service may be able to help address retirement planning for individuals with simple planning needs, such as only one or two accounts.

One respondent noted that robos are a bit like tax software: they can help people with a range of fairly standard financial situations, but investors will need to pay more for more

sophisticated help, whether that comes in the form of more advanced software or access to a tax consultant. The good news is that robos do offer individuals with limited means access to financial planning options. Robos have made access to low-cost investment advice available to investors, and in many cases they have targeted investors in the earlier stages of their investing lives.

Once an individual starts having multiple accounts, perhaps special health needs, and/or a partner who needs to be factored into the retirement equation, the situation becomes more challenging for a pure-robo model based on current capabilities. Over time, however, advances in technology might enable a purely technology-based platform to address more complex situations.

One interviewee noted that a do-it-yourself approach could 'suffer from a GIGO (garbage in garbage out) problem.' This person went on to note that, 'There are not set-it-and-forget-it types of decumulation software, because retirement income plans must constantly adapt to changing financial and personal conditions, such as serious illness or the death of a spouse. Trying to be your own decumulation advisor has some of the same pitfalls as trying to be your own lawyer: You're likely to have a fool for a client. You'll be inexperienced, and you'll tend to discount or underestimate certain risks like health care costs risks and the cost of longevity risk. So there's a learning curve. Few people understand the spectrum of risk they will face in retirement. Most simply want an answer to the question, how much can I afford to spend?'

It is unclear whether a pure-robo could address investors' need for reassurance, especially around highly consequential or irreversible decisions, such as when to start drawing social security. In addition, as investors age, they may need more time, support, and assurance with their retirement income decisions. Conversely, individuals already inclined to a do-it-yourself approach might be comfortable with a purely technology-based solution. This may also be the case for individuals, such as Millennials, who will reach retirement age having used a variety of technology-based tools

throughout their lives and who, when they retire, will likely have access to significantly more advanced tools available than currently exist. In addition, the more educated investors are about the decisions they will need to make and the factors to consider, the more comfortable they may feel making those decisions with input only from a robo platform. This may present an opportunity for firms to start educating investors about the decisions they will need to make well in advance of those decisions.

Data and analytic requirements. A purely technology-based platform will need to assimilate a broad range of quantitative and qualitative information to develop a sound, full-scope retirement financial plan. Factors include: the full range of an investor's assets and liabilities (e.g., bank accounts, 401(k)s, IRAs, pensions, mortgages and other debts), as well as those of the investor's spouse/partner, if relevant; an investor's plans or desires for activities in retirement, including how those plans may change as the retiree ages; an investor's health history as well as that of the spouse/partner; information about an investor's medical, long-term care and other insurance; and an investor's objectives regarding bequests.

The types of analyses a system would need to perform include: projecting the investor's lifespan; projecting health care expenses; budgeting for basic needs, health care and other desired goals, such as travel; assessing whether the investor is adequately funded to meet their projected basic needs, as well as other goals; assessing what measures, if any, to take if the investor is facing a shortfall (i.e., if assets are small relative to their retirement objectives and, most critically, relative to the retiree's basic needs); and determining when the investor should start drawing social security (which leaves aside the broader question of risks investors may face of not receiving some portion of their projected social security benefit due to policy or financial constraints on the system, if any). Also important is factoring in RMDs and tax planning; determining account withdrawal

sequencing, that is, from which accounts withdrawals should be made; and performing ongoing assessments of both the investor's projected lifespan and withdrawal rate to determine whether the two are aligned, including with respect to any bequests the investor wishes to make.

Competitive dynamics and the development of decumulation capabilities. Interviewees generally grouped robo providers into two general classes, each following somewhat different imperatives and time horizons in developing their decumulation services. The first group was the start-up firms whose business model is built entirely around their robo or hybrid platform. These firms are focused on rapid asset accumulation, since this is essential to their long-term survival. (The economics of the robo business require scale to produce sufficient revenue for a firm to be viable.)

With respect to large incumbent players that offer robos, such players are seen as aiming to create a new channel to service existing low account balance clients in an economically viable manner, and attract new small accounts, including, potentially, the children and relatives of higher net worth clients, with the long-term goal of using both as a feeder to obtain higher margin, human-advised investors' assets under management. In some cases, these incumbent firms have developed their own platforms, while in others, they have acquired or white-labeled a third party's platform. One interviewee noted that these direct-to-consumer companies might be the best place to start looking for robo-like decumulation strategies because they have been serving do-it-yourself clients for decades.

For both types of firms, return on investment for decumulation capabilities was a key point of focus. While the potential market is large, a number of interviewees thought that developing a pure robo-based decumulation solution would be technologically and financially challenging, at

least currently. Most interviewees thought that a hybrid approach would be necessary to serve investors effectively, at least in the near- to medium-term.

One interviewee commented, 'Companies are creating decumulation software for advisors, and advisors are creating decumulation software for themselves. Decumulation tools are at the stage where investment management software was several years ago—at the professional level. It's possible that some of the new decumulation software for advisors could eventually be streamlined enough and simple enough for a layperson to use.' If this development were to occur, it would, in some ways, mirror how robos developed capabilities previously available primarily to financial advisors and packaged that technology to make it directly accessible to consumers.

Cognitive decline. One significant aspect of aging is the increased incidence of cognitive decline, particularly as it relates to financial management. Interactions with a human advisor provide at least some opportunity for a firm to evaluate the competence of its clients, but that opportunity does not exist in an entirely online relationship. Most interviews agreed that this is a challenging problem for today's robos. The issue of cognitive decline is discussed in greater depth below.

Investor advocates. We spoke with investor advocates who noted that robos have significant potential to help consumers. Robos can democratize investing by offering investment and decumulation advice at a price point that most investors can afford. In addition, from a behavioral finance perspective, robos can help nudge investors to behave in ways that benefit them. For example, the online and mobile platforms that many robo-advisors offer is ideal for short and frequent communications to remind investors to update their information, check their spend rate, and monitor progress toward their goals.

They investor advocates also, however, raised important issues that investors should consider when considering a robo service. The first is that, even though robos may make advice

affordable, consumers still need to ask about costs, as these vary significantly along with services offered. It is not necessarily true that a robo-advisor will always be a low-cost option. Second, one investor advocate noted that, by their nature, robo-advisors provide accumulation and decumulation advice investors based on a common methodology. Thus, if the robo-advisor makes a mistake, then the mistake will likely affect many investors. Stated by the investor advocate more succinctly, 'If robos get it wrong, they get it wrong for lots of people.' Of course, the opposite is true, as well. If robos get it right, they can successfully deliver low-cost advice to a large swath of investors. Either way, investors, robo-advisors, and regulators must consider this point as digital investment advice matures.

Implications

Investor considerations. As older Americans shift from accumulating assets for retirement to decumulating assets in retirement, many will be looking for financial advice, regardless of the size and complexity of their asset base. In the accumulation phase, digital investment advice providers offer low-cost advice to investors both inside and outside employer-sponsored retirement plans, and they have an opportunity to do the same as people seek to generate income streams from these investments. There is surely a large market for investment advice for investors who have only a small pool of assets. Digital investment advice providers are filling this niche in the accumulation phase of retirement, and they hold the potential to fill this niche in the decumulation phase, as well.

As noted earlier, many firms offer hybrid advice models that provide different levels of interaction with a human advisor. This is a promising trend, because decumulating assets is complex and few digital investment advice platforms are advanced enough to handle complex decumulation scenarios without human intervention. Accordingly, the degree of customization that

clients need (or simply feel more comfortable receiving) could point them toward a robo-advisor that also offers varying amounts of human interaction.

In addition, the need for financial advice during the decumulation phase is likely to be nonlinear, or 'lumpy.' That is, an investor may need more of it at different key points or events, but perhaps rarely between those events, and it would be those inflections where human interaction would be most likely, or most valuable, to take place. For instance, human interaction may be needed when initially establishing a retirement income strategy, and then again, when RMDs begin, a healthcare shock occurs, or a spouse dies. Having access to a human advisor at these critical junctures may be important for investors, though, according to several of our interviewees, there may come a day when technology advances enough to make a pure-robo model viable.

The nonlinear nature of retirement income needs, combined with the vagaries of the markets, make it very important for investors to monitor and perhaps amend their retirement income strategies throughout retirement. Thus, even with a pure or nearly-pure digital investment advice approach, investors may still need or want to engage with the robo to update it about material changes in their situations. This is similar to the accumulation phase, where even investors using target-date funds (i.e., investors not using a robo) wish to monitor their funds and risk tolerance, to be sure their investment goals still align with their fund's strategy.

Age and cognitive decline. As we age, our decision-making is likely to be impacted by cognitive decline (Spreng et al. 2016; Hammond et al. 2017). This is a concern for all financial service providers and investors, but it may be more problematic for investors using digital advice for decumulation. By the very nature of the service provided, digital investment advice clients may interact with their advice providers less frequently than investors paying for higher cost, in-person advice. This, coupled with the fact that some robo clients may never interact with human financial

professionals, makes it harder for robo-advisors to identify cognitive decline. As such, investors using digital investment advice for decumulating their portfolios will need to carefully consider this issue.

One approach is for an investor to name a trusted contact whom an advisor can contact should the advisor be concerned about the client's pattern of financial actions. To encourage this practice, FINRA adopted amendments to FINRA Rule 4512 (Customer Account Information) in 2017, requiring firms to make reasonable efforts to obtain the names and contact information for trusted contact persons for each customer's account (see FINRA Regulatory Notice 17-11). This rule went into effect only recently (February 2018), and it is an important step in addressing the issue of investor cognitive decline in their later years.

Another important issue for investors to consider is the degree to which they wish to provide their advisor, whether human or robo, with a comprehensive view of their financial assets and liabilities, as opposed to simply an account-level view of assets. A more comprehensive understanding of a client's portfolio, and, if applicable, that of the client's partner, can help an advisor provide a more informed recommendations regarding how clients should decumulate their assets. Account aggregation can take three forms—the investor can actually move all their assets to one provider, inform their provider of all their holdings, or use an account aggregation tool, perhaps embedded within the robo-advisor's platform. The degree to which consumers are interested in account aggregation services is, as yet, unclear, given that the technology is fairly young. In addition, investors will need to weigh the perceived and actual risks of account aggregation, such as concerns about data security, privacy, and unauthorized access, with the benefits that data aggregation provides—namely, convenience and a comprehensive decumulation strategy (see also Rouse et al. (2019), CFPB (2017), and FINRA (2018a)).

The role of education. Much academic research shows that investor education is positively associated with effective financial decision-making (Lusardi and Mitchell 2014). The basics of investment risk, choosing an investment professional or firm, asset allocation, and the impact of fees on investment performance are all core building blocks of investor education, whether one is accumulating assets or drawing them down. But decumulation brings with it a different set of educational challenges than accumulation-oriented investor education.

During the accumulation stage, investor education typically focuses on issues like how to enroll (if not already automated) in a retirement plan, how much to save, and the benefits of diversification and compounding. Investors need additional information in the decumulation phase. For example, investors may need a refresher course on budgeting and debt management, basics that they may not have practiced for many years. In addition, as people evaluate robo providers, they will likely benefit from tips on questions to ask a robo firm prior to making a selection, including the level of human interaction a robo provides, and how a robo addresses issues such as cognitive decline, account aggregation, or privacy issues. Further, robo clients may need to hone their technical skills and upgrade their computer hardware/software, if they plan to utilize a digital investment advice provider (relying on computers at the public library is likely not an acceptable option for most).

Investors may also need assistance interpreting and utilizing the information that robo-advisors provide to their clients. One example pertains to the use of probabilities from Monte Carlo simulations, since some may not understand probabilities used when making financial decisions. Moreover, the manner in which this information is communicated can potentially affect investors' decisions. Gigerenzer (2002) has noted that using natural frequencies may be a better means of communicating risk than using probabilities—essentially changing the manner in which risks are

framed. For example, a robo-advisor might communicate to a client that he or she has an 80 percent chance of meeting a retirement income goal, that is, not running out of money in retirement; alternatively, the advisor could communicate that eight out of 10 investors in the same financial position will not run out of money in retirement. Research with physicians' understanding of risks to their patients suggests that the latter approach communicates risks more effectively than the former (Gigerenzer 1996; Hoffrage and Gigerenzer, 1998).

Investors may also need to be educated about robo-advisors approaches to decumulation. As one interviewee put it, 'They all have tilts—some programs will lead clients toward the purchase of a fixed indexed annuity, for instance. Others will be tilted toward the four percent rule or the automatic de-risking of a portfolio as its market value declines, perhaps resulting in the automatic purchase of a single premium immediate annuity. It may be possible to have the client, in effect, choose the tilt by answering a series of non-technical questions about risk and risk capacity.'

A basic understanding of what strategy an advisor uses could help an investor make more informed decisions about which robo-advisor best meets his or her needs. This is similar to learning how target-date funds operate, the glide-path they employ, and whether they are 'to' or 'through' retirement, which can help investors accumulating assets choose the right target-date fund for their needs (FINRA 2018b, US SEC 2010). Investors should also be aware of the assumptions that go into their decumulation plan (e.g., which life tables a plan relies on). Similarly, something as straight-forward as the assumed rate of return on equity investments can have a large impact on the retirement prospects of investors. For example, some investors use historical returns on equities despite market forecasts that future returns will be lower than historical returns (Horneff et al. 2018).

The channels through which this education will be delivered are as yet unknown, though most robo-advisors with whom we spoke recognized that they would need to bear some of the responsibility. Information to help investors navigate the decumulation phase may also be provided by regulators, employer, non-profit organizations, investor advocates, and the media. Sources of educational information are likely to grow, as Baby Boomers continue to retire and more people will need to generate sustainable retirement incomes.

Conclusion

Assets under robo management have grown in recent years, with most robos catering to younger investors seeking to accumulate assets. Yet a few of these entities now provide decumulation services for their clients, and more intend to do so in the future.

This state of affairs offers both opportunities and challenges. Robo platforms offer promise in their ability to provide decumulation services to large numbers of investors, including those with relatively small accounts, at relatively low cost. As with automation and accumulation services, decumulation robo platforms also offer an opportunity to steer investors away from detrimental behaviors including overconfidence, loss aversion, mental accounting, framing, and more. In short, they take emotion out of decumulation. Consumers will also gain more choice, since even now, there are differences in offered services, investments, decumulation strategies, assumptions, and costs.

We can expect continued innovation regarding how best to optimize retirement income while limiting risk. For instance, some robos are testing the practice of using more liquid and safer investments to provide a level of income sufficient to meet a retiree's basic needs, paired with higher-risk investments to cover discretionary expenses and to facilitate continued growth of the

portfolio. The door is open to robo-specific studies focused on decumulation. Such research will help guide platform developers as they implement or modify their choice of decumulation models. Yet investors still face the challenge of having to select an appropriate advisor and remain engaged in the advice process, without having generally agreed-on benchmarks against which to assess the validity of a decumulation methodology or its historical effectiveness. Customers will also need to do their homework to understand what they receive for their money, what they own, and how their investments are managed.

It is also worth emphasizing that robos cannot solve the problem of financial illiteracy. Too many people still do not understand the basics of risk and reward, or how core investments such as bonds gain or lose value, much less more complicated concepts such as probability which figures in most robo simulations. Financial educators, including those who work for robo-advisors, face considerable challenges in explaining decumulation within a robo platform. Nevertheless, advances in robo capabilities may make financial education and financial capability less important, in the future.

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Endnotes

[1] See, however, Horneff et al. (2015).