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Robo-advice and the future of delegated investment

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DEAR READER,

Welcome to edition 51 of the Capco Institute Journal of Financial Transformation.

The global wealth and asset management industry faces clear challenges, and a growing call for innovation and transformation. Increased competition, generational shifts in client demographics, and growing geopolitical uncertainty, mean that the sector needs to focus on the new technologies and practices that will position for success, at speed.

There is no doubt that technology will be at the forefront of a responsive and effective wealth and asset management sector in 2020 and beyond. The shift to digitization, in particular, will see the speeding up of regulatory protocols, customer knowledge building, and the onboarding process, all of which will vastly improve the client experience.

This edition of the Journal will focus closely on such digital disruption and evolving technological innovation. You will also find papers that examine human capital practices and new ways of working, regulatory trends, and what sustainability and responsible investment can look like via environmental, social and corporate governance.

As ever, I hope you find the latest edition of the Capco Journal to be engaging and informative. We have contributions from a range of world-class experts across industry and academia, including renowned Nobel Laureate, Robert C. Merton. We continue to strive to include the very best expertise, independent thinking and strategic insight for a future-focused financial services sector.

Thank you to all our contributors and thank you for reading.

Lance Levy, **Capco CEO**

ROBO-ADVICE AND THE FUTURE OF DELEGATED INVESTMENT

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ABSTRACT

Robo-advisors can replace financial advisors and asset managers at low costs. However, human managers and advisors will survive. This is predominantly because although robo-advisors primarily appeal to a clientele of already financially sophisticated investors, they lack some of the qualities people look for in a "money doctor", and their business models have not yet stood the test of time. While a general algorithm aversion is absent in the financial domain, even tech-savvy millennials do not particularly favor robo-advisors. As new survey data shows, investors view algorithms as an aid to human managers rather than competitors. A hybrid model with humans and robos working together, as already implemented by some financial institutions, might be the future of delegated investment.

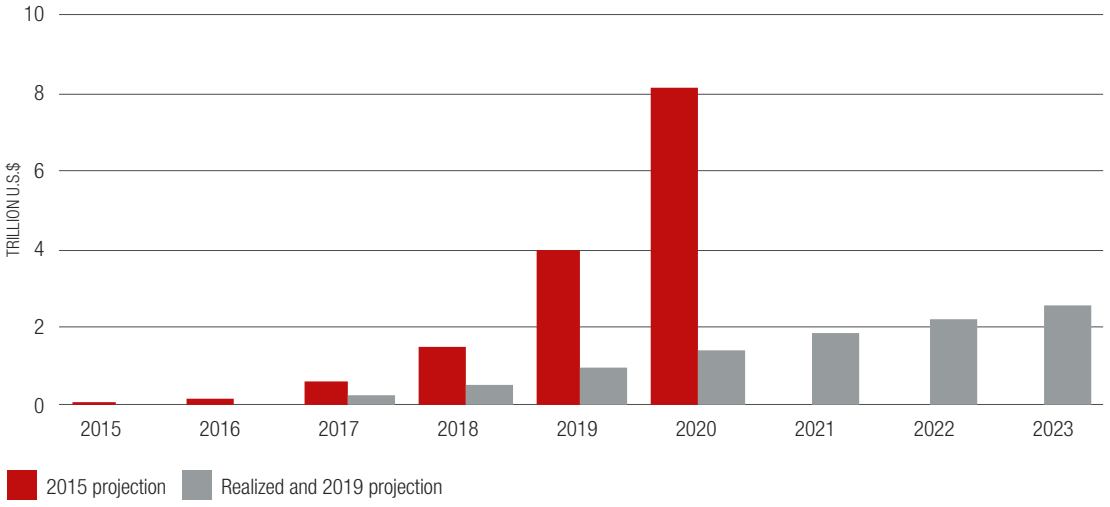
1. INTRODUCTION

In a German savings bank, new assistant Pepper greets customers with his metallic voice. The humanoid robot stands four feet tall, can move its arms and head, and has large black eyes. It responds to simple questions and also offers customers a touch screen to navigate. While Pepper corresponds to the image that many of us have in mind when thinking about robots, his robo-colleagues working in investments look less the part. A typical robo-advisor is nothing more than an algorithm that processes data provided by customers to come up with an investment recommendation.

It is no wonder that many employees in the financial services industry perceive the digital transformation as a threat. Delegated investment is no exception, as a robo-advisor can serve many clients at a time and might put human financial advisors, as well as asset managers, out of business. In the words of practitioners "over many years, the fund industry has operated with a false sense of security, assuming that algorithms and computing power would digitize and revolutionize trading, but that the right products would ultimately be selected by humans." [Vater et al. (2017)]. In this article, I will examine to what extent these algorithms might indeed be able to replace their human counterparts.

One has to concede that the robo-advisors operating today do not literally "select" products but are programmed by humans to generate portfolio suggestions based on a number of inputs by clients. They are often restricted to a menu of ETFs or index funds, which they offer in varying compositions. However, it takes little imagination to foresee that with further progress of artificial intelligence (AI), the next generation of robo-advisors will be able to choose assets more freely, directly from the capital markets. One might further argue that robo-advisors do not actually "advise" clients, as they are limited in the ways in which they can provide explanations or react to questions. While some robos are designed to illustrate portfolio properties and to educate their clients on risks and return, they are so far unable to effectively communicate with customers or to address their individual needs.

Figure 1: Past projections and realized trajectory of the market for robo-advice (Global AUM in the robo-advisor segment)



Source: Statista

Despite these current limitations, projections for market share and assets under management (AUM) for robo-advisors have been bright. Forecasts for global AUM in the year 2020 were as high as U.S.$8 trillion [Statista (2015)], or U.S.$2.2 trillion in the U.S. alone [O'Keefe (2016)]. These predictions have not been met, as global AUM in 2019 is closer to U.S.$1 trillion [Statista (2019)], with the U.S. accounting for more than half of this amount (Figure 1). Market penetration is not particularly high either, as in most countries the fraction of people using a robo-advisor is below 1 percent. Nevertheless, the segment has grown strongly and the verdict on whether robo-advisors will be successful in the long term is still pending.

Startups such as Betterment and Wealthfront (both founded in 2008) were pioneers in the market and have collected more than U.S.$10 billion each. The financial crisis initially spurred the development of investment advisory tools, as customers were looking for investment alternatives and traditional financial institutions had lost a great deal of trust. However, established players have now leapfrogged the fintech startups. Vanguard and Schwaab are currently listed as the largest robo-advisors in the world and have benefitted from their existing customer base and distribution channels. Many banks have by now introduced their own robo-advisor or are preparing to do so. However, some have also abandoned their plans (e.g., UBS and Commerzbank).

The average client holds about U.S.$20,000 with their robo-advisor, which suggests that it is indeed the broad retail market it taps into. As with any new service, most customers regard it as an addition to their existing investments and are reluctant to let the robo manage their entire financial wealth. As the AUM per customer remains rather stable, winning new customers is key to growth in the increasingly competitive market of robo-advice.

2. OPPORTUNITIES AND CHALLENGES FOR ROBO-ADVISORS IN ASSET MANAGEMENT

The market potential for robo-advisors predominantly exists due to the presence of economies of scale. A challenge for any delegated management of assets is that sufficient fees need to be generated from the offered service. For this reason, the market has been segmented for a long time, with the extensive care provided by private wealth management only available to high net worth individuals. The average retail investor has had to fall back on off-the-shelf mutual funds or to rely on a financial advisor usually paid on commission. It is well known that the latter setup creates a conflict of interest, which can lead to advisors pursuing their own incentives to the detriment of their clients.

The fixed-fee model has not gained enough traction to solve this issue, and has problems of its own. When the U.K. government banned commission-based advice in 2013, there were concerns that many people would remain unadvised. Indeed, in a consumer survey asking people how much they are willing to pay for financial advice, two-thirds responded "nothing" and a further 20 percent said "less than £100" [ABI (2010)]. Investors seem to prefer their fees to be deducted from their investments, as this way the total costs remain opaque (even though they exceed £100 for the typical investor). Despite this, in some circumstances, conflicted advice might be better than no advice at all [Chalmers and Reuter (2015)].

Robo-advisors present a solution to this dilemma, as they promise to offer affordable advice for a large number of customers. Once programmed and rolled out, the robo-advisor can be used by many customers, even at the same time. Unlike human advice, the marginal cost of an additional investor is close to zero; at least until the high acquisition costs incurred to attract new customers are taken into account.

Having said that, the costs are customer acquisitions are not insignificant, and indeed need to be taken into account. Industry experts report that the cost of attracting each new customer ranges between €500 and €1,000 within the German market [TME AG & Growth Ninjas (2018)]. Given the low fees charged by robo-advisors, typically around 0.5 percent, combined with the small portfolio sizes, around €20,000 for each customer, it can take a long time to amortize these costs. Considering the fixed costs for implementation (including regulation), it has been estimated that AUM of no less than U.S.$10 billion are needed for a robo-advisor to break even [International Banker (2019)]. Only the largest robo-advisors reach this threshold today and in fact, many robos are not as yet profitable.

Academics greeted the arrival of robo-advisors with excitement, and not just for their low costs. They are attractive from an academic perspective because they follow a passive approach using ETFs or index funds and recommend that clients invest in broadly diversified portfolios made up of multiple asset classes. This is consistent with finance research that has not found persistent outperformance from active management [Fama and French (2010)]. Instead, diversification is often described as the only "free lunch" in investments. With academic recommendations and robo-advisory practice so well aligned, it is no wonder that a finance professor is behind Germany's largest robo-advisor Scalable Capital.

Indeed, recent empirical research finds that robo-advisors are able to steer investors away from known behavioral biases, such as the disposition effect or trend chasing (D'Acunto et al., 2019). However, there are also unintended consequences, such as investors logging in and trading more frequently. The benefit of robo-advice is greatest for those adopters who hold underdiversified portfolios and who are most biased. This group is, however, the hardest to reach for robo-advisors, in particular those who do not invest in the stock market at all.

In their on-boarding, robo-advisors benefit from behavioral research on risk communication and eliciting risk preferences. Although MiFID II (Markets in Financial Instruments Directive) requires that financial institutions collect information on a client's risk preferences, most robo-advisors go beyond this requirement. They display return distributions, simulate outcomes, show alternative portfolio risk levels, and, in some cases, employ interactive tools in their risk communications. More sophisticated approaches can improve clients' risk and return assessment, as well as their confidence in the recommendation [Kaufmann et al. (2013)]. Some robo-advisors highlight volatility or other risk measures such as the value-at-risk (e.g., scalable capital).

Many robo-advisors have questionnaires regarding risk preferences to assign an appropriate portfolio. However, these questionnaires usually include few questions and the questions do not necessarily have an impact on the portfolio recommendation [Tertilt and Scholz (2018)]. Ideally, the preference elicitation relates to the interactive demonstration of portfolio properties. This means that an investor can adjust the risk level of the portfolio and watch the consequences for portfolio outcomes. Such tools can also be used in presence of a human wealth manager in a hybrid setting (as demonstrated for example by the Warburg Navigator by M.M. Warburg & Co.). The tools provide information that the manager might not obtain in a typical conversation with clients.

3. STOCK PICKERS AND MONEY DOCTORS

Many investment managers believe that their primary task is to generate "alpha", or outperformance relative to some pre-defined benchmark. Consequently, they subject themselves to the active versus passive debate, with the result that their contribution to the investment process is questionable. If one identifies as a stock picker, then it is only natural that they will be evaluated in terms of their stock picking abilities. An interesting study reveals that clients would have been better off had they not answered the phone when their advisor called to discuss transactions in individual stocks [Hoechle et al. (2017)].

Other research finds that advisors are not able to customize portfolios based on the preferences of their clients [Foerster et al. (2017)]. Instead, advisors and asset managers bring in their own behavioral biases, which might be subsumed under "the human factor", as none of us are free from bias. Robo-advisors have an advantage in these domains. A properly defined algorithm matches customers to portfolios that more adequately reflect their preferences. A passive low-cost strategy will beat most active managers and advisor recommendations [Garleanu and Pedersen (2019)]. If human managers intend to compete in these areas, theirs is a lost cause, in particular with further improvements in AI.

It might require a change in perspective in what an asset manager or advisor should achieve to define their future role. There are many anecdotes about how during the financial crisis the phones of wealth managers did not stand still. Worried clients called in to inquire about the status of their portfolios; needing assurances from their managers that they should not to succumb to panic. Some might view such calls as distracting. Should one not concentrate on much needed portfolio adjustments instead of comforting clients? In reality, such conversations are part of the value added of human managers or advisors, as they represent one of the things a robo currently cannot do.

Broadening this role description, asset managers can be viewed as "money doctors" [Gennaioli et al. (2014)]. In an analogy to medical doctors, they are trusted experts who provide guidance to people who know relatively little about finance. The financial services industry recognizes this and often advertises their services based on trust, experience, and dependability. Asset managers provide investors with peace of mind, as well as the confidence to invest in risky assets. In addition, delegated investment offers the opportunity to blame someone else when something goes wrong [Chang et al. (2016)].

It is no coincidence that robo-advisors have a hard time attracting clients who are not as yet investing at all. Although the degree of financial knowledge required to use different robo-advisors varies, the mental barrier for the uninitiated remains high. Robo-advisors cannot fill the role of a money doctor to a sufficient extent. Accenture (2015) has defined what they call "enduring human strengths": areas in which robo-advisors are unlikely to catch up soon. Among those are the ability to steady clients in through difficult markets, to persuade to action, to provide validation, and to synthesize custom client solutions.

If investment managers adopt their role as money doctors, it will become easier for them to outsource other tasks to technology. An effective division of labor relies on clearly defined competences.

4. ALGORITHM AVERSION AND THE CO-EXISTENCE OF HUMANS AND ALGORITHMS

One important question for a wealth manager or financial advisor is whether to use technology only "behind the scenes" or in direct interaction with the client. Robo-advisors, in their pure form, require the willingness of the customer to engage with an algorithm. They usually do not have any human touchpoint in the process. The rising number of investors in the segment shows that there is demand for this self-directed approach. However, these early adopters of robo-advisors are a selected group of (probably few) people who find online-only advice appealing. We cannot take them as proof that robo-advice will become a market-wide phenomenon.

"If investment managers adopt their role as money doctors, it will become easier for them to outsource other tasks to technology."

On the contrary, researchers have demonstrated the presence of algorithm aversion in many domains. The term implies that people either have a general preference for humans over algorithms, or at least will abandon an algorithm quickly if they see it stumble. An example for the latter case is experiments in which participants tie their incentives to either a human expert or an algorithm for predictions in various fields [Dietvorst et al. (2015)]. While the algorithms on average clearly outperform the humans, many participants turn away from them after mistakes. There seems to be the notion that an algorithm should be free from error. If not, there is something systematically wrong that will repeat itself.

Investing is a domain in which mistakes are inevitable. Not all investments will turn out well, and, in particular, not all the time. Investors in a portfolio constructed by a robo-advisor may at least occasionally find themselves in the red. If people lose confidence in an algorithm quickly, their stay with the

robo-advisor will be short-lived. On the other hand, finance is a quantitative field and investors might view it as the natural habitat of an algorithm. Indeed, financial decision making seems to be special, as participants in another experiment do not show algorithm aversion [Germann and Merkle (2019)]. Both initially and in the long-run investors favor the algorithm, but are not immune to a dip in followership after observing investment mistakes.

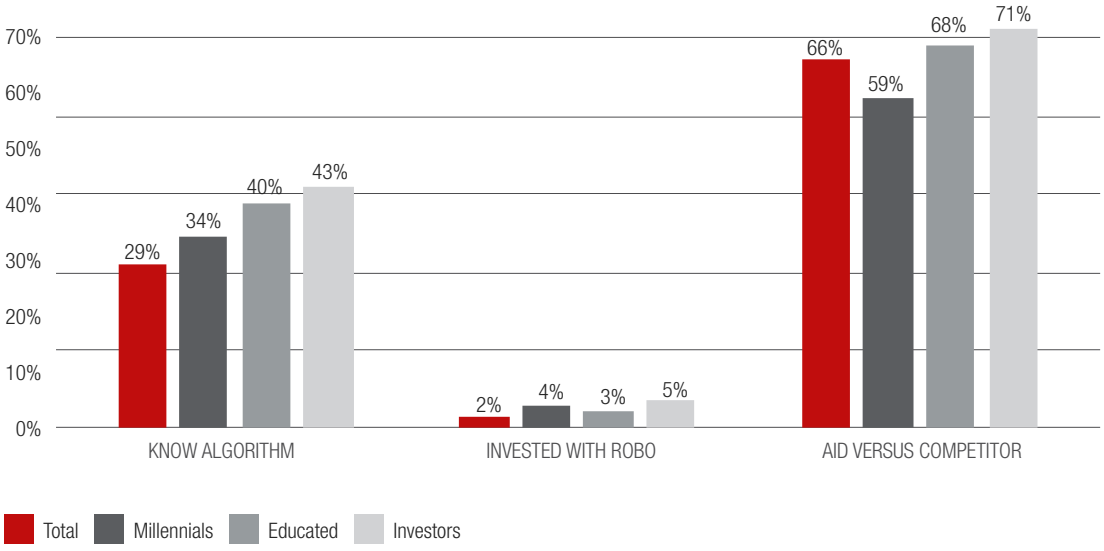
> *"The prevailing opinion is that technology serves as an aid to a human manager rather than a competitor. Both have different qualities in the investment process."*

What we can learn from this research is how to overcome algorithm aversion. In another study, Dietvorst et al. (2018) find that it helps to let humans adjust the algorithms' proposals, even slightly. Then people feel more in control and are more satisfied with the proposal. It is, therefore, a good idea for a robo-advisor not to provide a take-it-or-leave-it offer as a final output, but to allow for some modifications. Of course, it is always possible for a customer to change some of the input variables to receive a different outcome. However, it is better yet to make this process transparent and show what consequences, for example, a risk adjustment has on the final portfolio composition. The interactive nature of robo-advice tools can increase their appeal and usability – at least for those who know what they are doing.

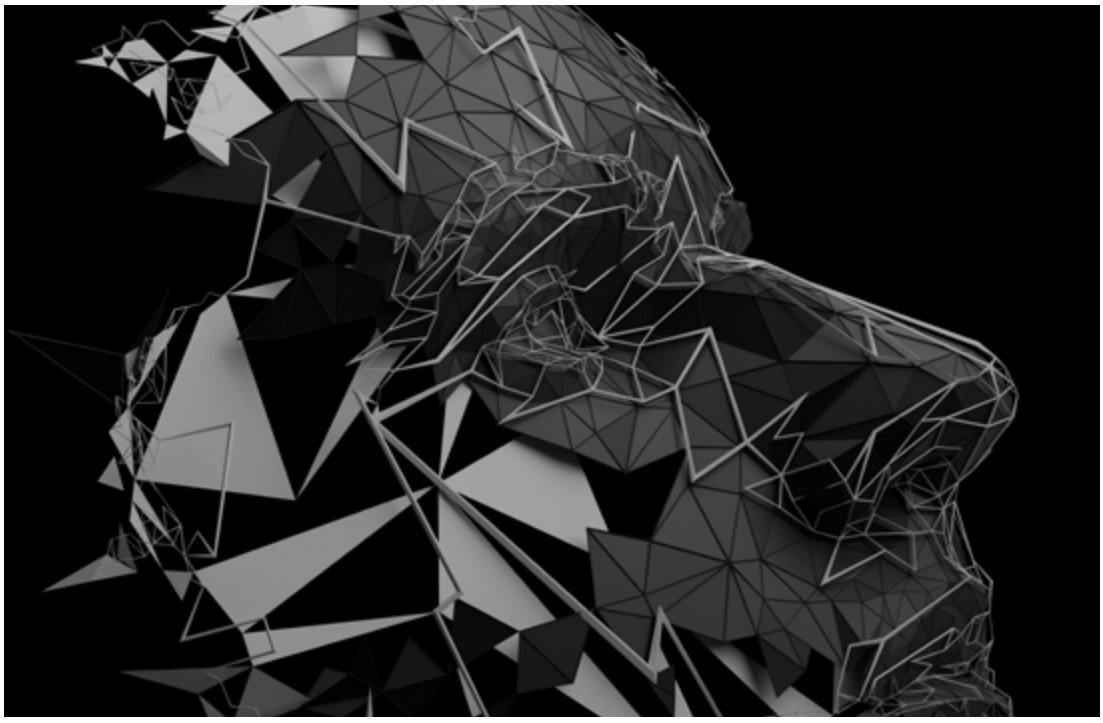
In a survey of 2,061 representative German adults, which I ran in late 2019 with the help of YouGov, about a third of the participants had some idea of what an investment algorithm is, but only 2 percent had already invested with a robo-advisor. A majority view algorithms as an aid to human investment managers rather than a competitor (Figure 2). Unlike what conventional wisdom might suggest, tech-savvy millennials are not much more in favor of digital solutions; overall results are not dramatically different for this age group (here 34 and younger). A study by FINRA Foundation and CFA Institute (2018) finds the same: the youngest cohort also values human interaction when it comes to their investments.

People who are more educated and those with investment experience are more likely to have heard of investment algorithms and have higher take-up rates. Robo-advisors seem to have the hardest time entering a market of financially less literate, non-invested households. While this group would probably benefit most from low-cost diversified investments, they are also the group that is most likely looking for a "money-doctor" for handholding.

Figure 2: Knowledge, take-up, and opinion about robo-advisors in Germany (2019)



Source: YouGov, own survey



Not all investors fancy interacting with an online-only robo-advisor and some situations may require human intervention, even for those normally satisfied with the robo. Even Betterment, as one of the pioneer robo-advisors, recently added human advisors to their offerings. A move to attract those customers who do not feel comfortable with only the algorithm at their disposal. The Financial Times noted in 2017 that the wish "to speak to someone" is ubiquitous in robo-advisory [Beioley (2017)]. Some fintechs seek to introduce low-cost human touchpoints, while others begin to differentiate their business based on wealth level and sell human advice as a premium product. Yet, others start out as a hybrid service from the beginning [Cocca (2016) discusses the different advisory models in more detail].

This is consistent with the prevailing opinion in the population that technology serves as an aid to a human manager rather than a competitor (Figure 2). Investors understand that both have different qualities in the investment process. Similar evidence comes from a U.S. survey by the Financial Planning Association (2016). Obtained data on customer behavior can be used to better target the costly contacts to human advisors (e.g., U.K. robo-advisor Nutmeg).

How do investors view human experts that rely on technological support? Results from the medical domain look discouraging. Patients perceive physicians, who employ a computer-based diagnostic aid, as less competent [Arkes et al. (2007)]. To use technological assistance seems to undermine their status as an expert. However, not so in finance: it is widely accepted that financial advisors will not find investment proposals just by searching their brains. The image of the profession is that some number crunching is necessary to find a solution. It, therefore, feels natural to employ technology [Germann and Merkle (2019)].

5. CONCLUSION

With technological progress, some professions disappear, while others change forever. Robo-advisors in principle can replace financial advisors and asset managers at low costs. When they emerged, academics and practitioners alike mainly saw opportunities. Economies of scale, an investment process that links goals and preferences to adequate recommendations, an impartial agent without behavioral biases, and fewer conflicts of interest. It seemed only a matter of time until these advantages would pave the way for fintechs or bank-owned robo-advisors to obtain a major market share.

However, human managers and advisors will survive for a number of reasons:

- Robo-advisors primarily appeal to a clientele of already financially sophisticated investors. Not only are they the easiest group to reach for a new offer on the market, but also by design many robos demand a certain level of financial literacy.
- Robo-advisors lack some of the qualities people look for in a "money doctor", which range from the initial encouragement to invest in risky asset classes to the opportunity to initiate contact to bring up a specific question.
- The human touch is valued highly by millennials as well, which implies that it will not go away just by the passage of time.
- The business model of online-only robo-advisors still has to stand the test of time. Currently, there is a mismatch between the acquisition costs for each customer and the meager fee-income. Only very large robo-advisors can exploit the economies of scale, as the fixed costs for implementing an advisory tool are high.

Consequently, a hybrid model with humans and technology working hand-in-hand is widely advocated as the most promising solution. Most financial institutions are still in the experimental stage with such offers. On one end, robo-advisors have started to introduce human advisors as a backup that customers can turn to. Early reports suggest infrequent usage of the additional service, but this might be a direct consequence of the existing customer base self-selecting into unassisted robo-advice. On the other end, wealth managers have started to employ digital tools in their advice processes. They face the opposite problem that customers might be skeptical about why they should stare at a screen instead of having a light-hearted conversation.

Just as with the hybrid car, the open question with the hybrid model of delegated investments is whether it represents an intermediate stage before robo-advisors that are "more intelligent" appear on the market, or the final stage of evolution. To fulfill the role of a money doctor it will not be enough to optimize the investment algorithm. Robo-advisors will need to acquire some abilities that we at least today view as typically human.

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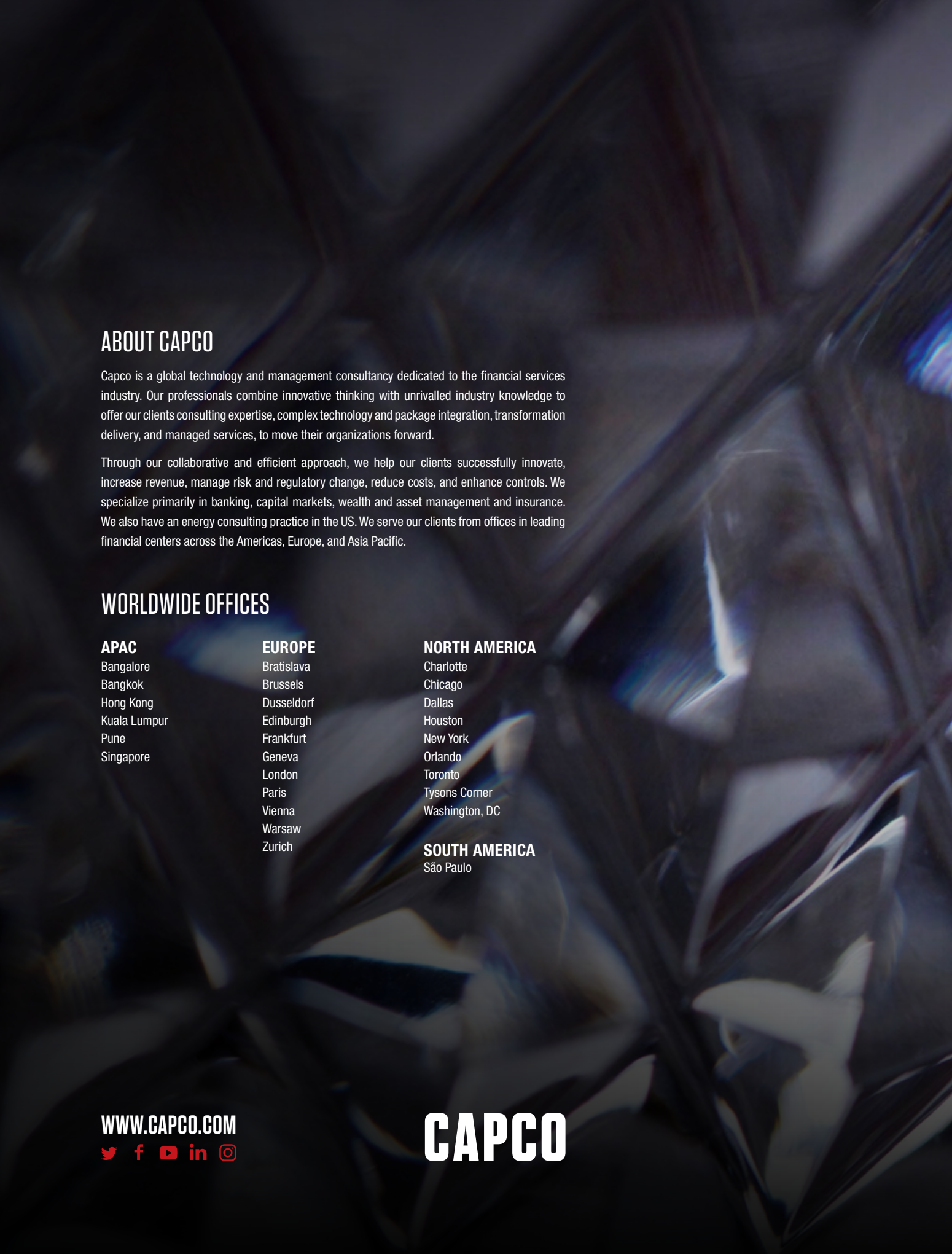

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