

Nudgitize me! A behavioral Finance Approach to minimize losses and maximize profits from Heuristics and Biases

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Abstract- Behavioral Finance is one of the most novel developments in Behavioral Economics. Since the end of the 1970ies a wide range of psychological, economic and sociological laboratory and field experiments proved human beings deviating from rational choices. Standard neo-classical profit maximization axioms were outlined to fail to explain how human actually behave. Human beings were rather found to use heuristics in the day-to-day decision making. These mental short cuts enable to cope with information overload in a complex world. Behavioral economists proposed to nudge and wink citizens to make better choices for them with many different applications in very many different domains. This paper reviews and proposes how to use mental heuristics, biases and nudges in the finance domain to profit from markets.

Key words- Behavioral Economics; Behavioral Finance; Hyperbolic Discounting; Nudge; Wink

1. BEHAVIORAL FINANCE

In an impressive line of experiments and field studies, the growing field of behavioral finance has offered behavioral insights on how markets deviate from rationality. Human actors are prone to base their investment choices on very many other factors than simply volatility and profit maximization opportunities (Puauschunder, 2017)[151]. The following article reviews some of the behavior insights gained in the last decades and shows ways how to profit from heuristics and biases.

Most recently nudging has started using the emerging insights about human heuristics and biases to improve decision making in different domains ranging from health, wealth and prosperity (Thaler & Sunstein, 2008)[197]. Behavioral insights teams have been formed to advise individual governments – e.g., Australia, Austria, Canada, Colombia, Germany, Italy, the United Kingdom, and the United States, intergovernmental entities such as the European Commission, or global governance institutions, such as the World Bank and the International Monetary Fund (World Bank Development Report, 2015)[208].

While standard microeconomic theory captures exponential temporal discounting to explain rational decision making; behavioral economics finds human time perception biased by heuristics, analogical thinking, and minimized effort (Allport, 1979[4]; Bowles, 2004[19]; Camerer, Loewenstein & Rabin, 2004[23]; Colinsky, 1996[34]; Ebert & Prelec, 2007[47]; Gentner, 2002[56]; Kahneman, 2011[101]; Kahneman, Slovic & Tversky, 1982[103]; Okada & Hoch, 2004[139]; Putnam, 2002[155]; Sen, 1971, 1993, 1997, 2002a[171][173][174][175]; Shah & Oppenheimer, 2008[178]; Simon, 1979,1983[182][183]; Zauberman, Kim, Malkoc & Bettman, 2009)[209]. People's cognitive capacities to consider future outcomes in today's

decisions are limited (Doyle, 2013[43]; Laibson, 1997[111]; Loewenstein, 1992[115]; Milkman, Rogers & Bazerman, 2009[131]; Read, Loewenstein & Kalyanaraman, 1999[158]; Read & van Leeuwen, 1998)[159].

Decisions in market situations have been found to be overconfident, myopic and people being subject to what is called preference reversal – they are simply not consistent in following through with their plans. Laibson's (1997)[111] hyperbolically decreasing discounting functions describe more accurately the choice behavior of individuals, who tend to be impatient for smaller rewards now rather than waiting for larger ones later (e.g., Ainslie, 1992[1]; Becker & Murphy, 1988[13]; Doyle, 2013[43]; Estle, Green, Myerson & Holt, 2007[49]; Frederick, Loewenstein & O'Donoghue, 2002[52]; Green, Fry & Myerson, 1994[61]; Green & Myerson, 2004[62]; Hansen, 2006[64]; Henderson & Bateman, 1995[67]; Kirby, 1997[107]; Kirby & Marakovic, 1995[109]; Laibson, 1997[111]; Loewenstein & Prelec, 1993[116]; Mazur, 1987[123]; Meyer, 2009[128]; Murphy, Vuchinich & Simpson, 2001[135]; Myerson & Green, 1995[137]; Rachlin, Raineri & Cross, 1991[156]; Sterner, 1994)[188]. Dynamically inconsistent preferences reverse as people are patient when deciding for the future and impatient when choosing for now (Hornsby, 2007[97]; Laibson, 1997[111]; McClure, Ericson, Laibson, Loewenstein & Cohen, 2007[124]; Meyer, 2013; Reed & Martens, 2011[161]; Thaler, 1981)[193]. Field and laboratory experiments provide widespread empirical evidence for hyperbolic discounting and self-control failures (Frederick et al., 2002[52]; Hoch & Loewenstein, 1991[70]; Sen, 1971, 2002b)[171][176] on money management (Alberini & Chiabai, 2007; Chabris, Laibson & Schuldt, 2008[25]; Collier & Williams, 1999; Harrison, Lau & Williams, 2002[65]; Keller & Strazzera, 2002;

Kirby & Marakovic, 1995; Laibson, 1997[111]; Laibson, Repetto & Tobacman, 2003; Salanié & Treich, 2005[167]; Slonim, Carlson & Bettinger, 2007; Thaler & Shefrin, 1981; Warner & Pleeter, 2007)[204], financial benefits (Cairns & van der Pol, 2008), credit card debt (Meier & Sprenger, 2010; Shui & Ausubel, 2004), medical adherence (Trope & Fishbach, 2000)[200], public health (Bosworth, Cameron & DeShazo, 2006; Cameron & Gerdes, 2003[24]; Chapman, 1996a; Duflo, Banerjee, Glennerster & Kothari, 2010; Horowitz & Carson, 1990[98]; van der Pol & Cairns, 2001), addiction (Badger, Bickel, Giordano, Jacobs, Loewenstein & Marsch, 2007; Becker & Murphy, 1988[13]; Heyman, 1996; Laux & Peck, 2007; Madden, Bickel & Jacobs, 1999; Petry & Casarella, 1999)[141], social security (Mastrobuoni & Weinberg, 2009), fiscal policies (Keeler & Cretin, 1983), commitment (Duflo, Kremer & Robinson, 2008; Sen, 1977, 2002b), health exercise (DellaVigna & Malmendier, 2004, 2006), employment (DellaVigna & Paserman, 2005), procrastination (Reuben, Sapienza & Zingales, 2010), diet (Read & van Leeuwen, 1998), subscription discipline (Oster & Scott-Morton, 2005), animal care (Green & Myerson, 1994[61]; Mazur, 1987)[123], and consumption (Milkman, Rogers & Bazerman, 2008[132]; Read et al., 1999[158]; Wertenbroch, 1998). Failures to disciplinedly stick to plans for giving in to immediate desires (Ainslie & Haslam, 1992[2]; Read, Frederick & Airoldi, 2012; Strotz, 1956) are explained by people caring less about future outcomes in the eye of future uncertainty (Luce & Raiffa, 1957; Shackle, 1955), perceived risk (Mas-Colell, Whinston & Green, 1995), and transaction costs (Chung & Herrnstein, 1967[33]; Epper, Fehr-Duda & Bruhin, 2011; Frederick et al., 2002[52]; Kirby & Herrnstein, 1995; Mazur, 1987; Read, 2001). Presenting temporal snapshots for now and later concurrently helps overcome myopia (Puaschunder & Schwarz, 2012)[154].

Market actors seem to have large-scale deficiencies to scale risks and externalities with uncertain outcomes, which are not factored accordingly into market calculus (Hong, Li & Xu, 2016). For instance, regulatory concerns of markets inexperienced with climate change underreact to such risks and call for disclosing corporate exposures to risks of global warming (Hong et al., 2016)[83].

One of the most novel implications of heuristics, biases and nudges addresses behavioral finance concerned how to improve financial well-being through the sound understanding of how people actually behave. This paper explains some behavioral finance techniques that can be used to enhance your financial gain by diversification (Part 1.1), investing in crises-robust (Part 1.2), long-term sustainable market options (Part 1.3), demographics (Part 1.4) based forecasting, saving money through tangibility (Part 1.5) and safe havens (Part 1.6), or reaping benefit from outperforming market strategies and investigating the role of information (Part 2) and communication for

market reactions but also social influences in financial market management (Part 3).

1.1 Diversifying Nudges

When going on vacation and not knowing what the weather will be like, you better pack sunscreen and an umbrella. Diversification uses the same rational. When not knowing and unable to be influencing market decisions, one should be prepared for both – ups and downs. Diversification is a risk management technique to mix a variety of preferably contrary investments within a portfolio. A diversified portfolio featuring different kinds of investments will, on average, yield higher returns and pose lower risks than any narrow, single individual investment (Markowitz, 1959)[119]. Diversification thereby smooths out unsystemic risk. The different contrary options within a portfolio neutralize each other. Benefits of diversification hold if securities in one portfolio are not perfectly correlated, e.g., investing in domestic and foreign markets at the same time or betting on upswing and downswing options of markets concurrently.

Mutual funds are an easy and inexpensive source of outsourced diversification that have gained on popularity after the 2008/09 World Financial Crisis. While mutual funds provide diversification across various asset classes, exchange-traded funds (ETF) afford investor access to narrow markets such as commodities and international plays that would ordinarily be difficult to access. To ensure true diversification, divergent correlations among securities have to be achieved. What can we learn from diversification for nudging people into better choices?

For one, intertemporal choice structures have shown that when individuals judge alternative choices, their decision making is prone to be biased when evaluating alternatives one at a time. Contrary as standard utility theory would predict, presenting joint alternatives concurrently changes decision making outcomes towards people becoming more likely to make more rational choices (Bazerman & Moore, 2008[10]; Gourville & Soman, 2005; Tversky & Shafir, 1992)[202]. A natural tendency towards evaluating choices jointly rather than separately improves the quality of decisions as it alleviates complexity and allows to trade-off alternatives directly (Bazerman, Loewenstein, & White, 1992[9]; Bazerman & Moore, 2008[10]; Bazerman, Moore, Tenbrunsel, Wade-Benzoni, & Blount, 1999; Bazerman, Schroth, Pradhan, Diekmann, & Tenbrunsel, 1994; Irwin, Slovic, Lichtenstein & McClelland, 1993; Kahneman & Ritov, 1994). Decision making failures can thus be curbed when several choices are presented together (Milkman, Mazza, Shu, Tsay & Bazerman, 2012)[130].

Intertemporal discounting and intergenerational equity research finds that human capacities to consider future outcomes in today's decision making are limited (Laibson, 1997; Milkman et al., 2009; Read et al.,

1999[158]; Read & van Leeuwen, 1998). The hyperbolic discounting literature describes human decision making to be constrained over time (Laibson, 1997; McClure et al., 2007) and shows that people tend to choose patiently when deciding for the future and impatiently when choosing for the present. Field and laboratory experiments provide widespread empirical evidence for this discounting bias ranging from savings (Chabris et al., 2008[25]; Laibson et al., 2003; Thaler & Shefrin, 1981)[196], credit card borrowing (Meier & Sprenger, 2010; Shui & Ausubel, 2004)[180], and financial investment. Unraveling ways how to improve impulsive decision making and nudge people into foresighted control promises a cost-effective means to better day-to-day decisions. Different interventions have been proposed to curb harmful impulsivity. Long-term visions and future-oriented planning changed by commitment, goal setting, planning and incentives promise to improve decisions (Ariely & Wertenbroch, 2002[6]; Ashraf, Karlan & Yin, 2006; Beshears, Choi, Laibson, Madrian & Sakong, 2011; Gine, Karlan & Zinman, 2009[58]; Houser, Schunk, Winter & Xiao, 2010; Kaur, Kremer & Mullainathan, 2010; Trope & Fishbach, 2004).

Behavioral financiers knowing about the joint decision making advantage may choose their financial allocation options together. Joint decision making advantages may thus become a powerful means to overcome narrow investment options. Bundling of two alternate outcomes of the own performance has also proven to offset separate bills' costs while preserving their net benefits. Bundled legislations were favored over their individual components and increased the psychological willingness to accept alternative perspectives (Milkman et al., 2012) and to embrace diverse stakeholders' viewpoints. In intertemporal predicaments, presenting two temporal snapshots concurrently could serve as a means to overcome intertemporal decision making biases (Puaschunder & Schwarz, 2012)[154]. A concurrent presentation of options may thus lead to a more diversified portfolio choice.

When facing intertemporal dilemmas, presenting two generational points of view concurrently could be a useful tool to make the future present during the time of the decision. Concretely in financial predicaments, eliciting different decision outcomes concurrently could implicitly lead decision makers to make less intertemporally biased choices. For instance, financial decision makers could envision that they save money according to their personal plans and as anticipated. Well-informed behavioral financiers, however, could also envision that they will fail to stick to their plan. Envisioning these two scenarios together will likely help curbing unfavorable over-confidence and aid decision makers making wiser choices.

Joint decision making could thereby serve as a means to overcome intertemporal decision making biases and in

particular help implementing real-life relevant financing strategies. Extending the intertemporal choice literature and bundling strategies, future research could examine how presenting positive and negative outcomes could aid in the wish to stick to self-imposed financial plans in order to show that this strategy helps gain a more widespread decision perspective that saves people from harmful myopic decisions. The temporal policy bundling strategy could serve as a powerful tool for implementing disciplined choices in the finance domain.

1.2 Crises-Robust Market Options

Today social responsibility has emerged into an en vogue topic for the corporate world and the finance sector. Contrary to classic finance theory that attributes investments to be primarily based on expected utility and volatility, the consideration of social responsibility in financial investment decisions has gained unprecedented momentum (The Economist, January 17, 2008; The Wall Street Journal, August 21, 2008).

Financial social responsibility is foremost addressed in Socially Responsible Investment (SRI), which imbues personal values and social concerns into financial investments (Schueth, 2003)[170]. SRI thereby merges the concerns of a broad variety of stakeholders with shareholder interests (Steurer, 2010). SRI is an asset allocation style, by which securities are not only selected on the basis of profit return and risk probabilities, but foremost in regards to social and environmental contributions of the issuing entities (Beltratti, 2003[14]; Williams, 2005)[206]. SRI assets combine social, environmental and financial aspects in investment options (Dupré, Girerd-Potin & Kassoua, 2008; Harvey, 2008).

Socially responsible firms receive more lenient settlements from prosecutors and have higher resulting market valuations (Hong & Yogo, 2012). A one standard deviation increase in CSR is associated with 5 million dollars less in fines, or 25% lower than the mean and less costly subsequent monitoring. High CSR firms outperform low CSR firms by 2.4% in the six months following the announcement of the settlement (Hong & Liscovich, 2016; Hong & Yogo, 2012)[95].

The consideration of Corporate Social Responsibility in investment decisions is the basis for Socially Responsible Investment (SRI). SRI is an asset allocation style, in which securities are not only selected for their expected yield and volatility, but foremost for social, environmental and institutional aspects (Puaschunder, 2010). The most common forms to align financial investments with ethical, moral and social facets are socially responsible screenings, shareholder advocacy, community investing and social venture capital funding. SRI is a multi-stakeholder phenomenon that comprises economic, organizational and societal constituents. In recent decades, SRI experienced a qualitative and quantitative growth in the Western World that can be

traced back to a combination of historical incidents, legislative compulsion and stakeholder pressure. SRI is a context and culture-dependent phenomenon that seems to stem out of personal ethical and values that supplement profit maximization goals (Puaschunder, 2010)[143]. Socially responsible screenings are ‘double bottom line analyses’ of corporate economic performance and social responsibility. In screenings financial market options are evaluated based on economic fundamentals as well as social features and corporate conduct externalities (Schueth, 2003). In addition to the traditional scanning of expected utility and volatility, screenings include qualitative examinations of intra- (e.g., corporate policies and practices, employee relations) and extraorganizational (e.g., externalities on current and future constituents) features of corporate conduct (Schueth, 2003)[170]. In general screenings are based on corporate track records of societal impacts, environmental performance, human rights attribution and fair workplace policies as well as health and safety standards outlined in CSR reports. Consequentially screening leads to the in- or exclusion of corporations from portfolios based on social, environmental and political criteria. Positive screenings feature the selection of corporations with sound social and environmental records and socially responsible corporate governance (Renneboog, Horst & Zhang, 2007)[162]. Areas of positive corporate conduct are human rights, the environment, health, safety and labor standards as well as customer and stakeholder relations. Corporations that pass positive screenings meet value requirements expressed in their social standards, environmental policies, labor relations and community-related corporate governance (Puaschunder, 2015b)[146]. Negative screenings exclude corporations that engage in morally, ethically and socially irresponsible activities. Pro-active negative screenings refrain from entities with corporate conduct counter-parting from international legal standards and/or implying negative social externalities (Renneboog et al., 2007)[162]. Negative screenings may address addictive products (e.g., liquor, tobacco, gambling), defense (e.g., weapons, firearms), environmentally hazardous production (e.g., pollution, nuclear power production), but also social, political and humanitarian deficiencies (e.g., minority discrimination, human rights violations). Specialty screens feature extraordinary executive compensations, abortion, birth control, animal testing and international labor standard infringements (Dupré et al., 2008). Post-hoc negative screening implies divestiture as the removal of investment capital from corporations and/or markets. Divestiture is common to steer change in politically incorrect regimes, but also used to promote environmental protection, human rights, working conditions, animal protection, safety and health standards (Broadhurst, Watson & Marshall, 2003[21]; Harvey, 2008[66]; McWilliams & Siegel, 2000). Political divestiture describes foreign investment flight from

politically incorrect markets based on CSR information (Steurer, 2010). Political divestiture targets at forcing political change by imposing financial constraints onto politically incorrect regimes that counterpart from international law resulting in war, social conflict, terrorism and human rights violations (Puaschunder, 2010; 2015b)[143][146]. Prominent cases are South Africa during the Apartheid regime; governmental human rights violations in Burma as well as the current divestiture from fossil fuels movement (Puaschunder, 2013; 2015b)[144][146].

Positively screened SRI funds are more likely to feature IT-technology and alternative energy industries that attract innovative venture capital providers. Positively screened SRI options tend to be more volatile, yet if successful, grant high profitability – e.g., solar energy funds have significantly outperformed the market in recent years and remained relatively stable during the 2008 financial crisis. As for excluding high-return, high-volatility industries such as petroleum, defense and addictive substances, negatively screened options are more likely to underperform the market, at the same time are robust to overall market changes. Negative screening asset holders are more loyal to their choice in times of crises, which contributes to the stability of these funds. Data on the profitability of political divestiture indicates a potential first mover advantage for early divestiture (Puaschunder, 2010; 2016c; forthcoming a).

But wise behavioral finance strategists should also consider the ethical roots of SRI. SRI can be traced back to ethical investing of religious institutions and societal attention to social, environmental and political deficiencies (Puaschunder, 2013)[144]. In the 1960s shareholder activism of civil rights campaigns and social justice movements drove SRI. Since the 1980s positive screenings identified corporations with respective CSR policies and political divestiture became prominent in the case of South Africa’s Apartheid regime (Puaschunder, 2016d)[150]. Environmental catastrophes in Chernobyl and Bhopal as well as the Exxon Valdez oil spill triggered environmentally conscientious investment. SRI was propelled in the wake of the micro-finance and cooperative banking revolution. To this day, SRI is connected to global governance, for instance in the United Nations having launched ‘The Principles for Responsible Investment’ in collaboration with the NYSE in 2006. In the wake of the 2008 financial crisis, SRI is attributed the potential to reestablish trust through stability in financial markets (Puaschunder, 2016b)[148].

SRI motives are proposed to include apart from profitability calculus – socio-psychological motivating factors such as altruism, innovation and entrepreneurship, strategic leadership advantages, information disclosure, self-enhancement and expression of social values of socially responsible investors, who have a long-term focus (Puaschunder, forthcoming b). SRI options fulfill a

need for transparency and information disclosure and are therefore strategies to diminish uncertainty in purchase decisions.

In a cost and benefit analysis, SRI implies short-term expenditures, but grants long-term sustainable investment streams. In the short run, screened funds have a higher expense ratio in comparison to unscreened ones – that is social responsibility imposes an instantaneous ‘ethical penalty’ of decreased immediate shareholder revenue (Mohr & Webb, 2005[133]; Tippet, 2001). In addition, for investors the search for information and learning about CSR is associated with cognitive costs. Screening requires an extra analytical step in decision making, whereby positive screens are believed to be more cognitively intensive than negative ones (Little, 2008)[114]. Screening out financial options lowers the degrees of freedom of a full-choice market spectrum and risk diversification possibilities (Biller, 2007; Mohr & Webb, 2005; Williams, 2005)[206]. On the long run, SRI options offer higher stability, lower turnover and failure rates and litigation or consumer boycott risks compared to general assets (Dhrymes, 1998; Geczy, Stambaugh & Levin, 2003[55]; Guenster, Derwall, Bauer & Koedijk, 2005; Schroeder, 2003; Stone, Guerard, Gületkin & Adams, 2001). Being based on more elaborate decision making processes, once investors have made their socially responsible decision, they are more likely to stay with their choice (Little, 2008). As a matter of fact, SRI options are less volatile and more robust during cyclical changes (Bollen & Cohen, 2004)[17].

Behavioral finance specialists could not only combine and diversify the mentioned options of positive and negative screening. They could also seek to evaluate options concurrently to make the better choice.

If though investors decide to engage in sin stocks as for expected high returns, they are advised to – if trying to maximize their personal utility – invest in those stocks of non-norm-constrained institutions. Norm-constrained institutions are those with high transparency and exposure to public that eventually face a premium drawback when investing in sin stocks (Hong & Kacperczyk, 2007). They pay the price of sin in greater litigation risk, consumer boycotts and social norms punishing them for their visible misbehavior.

The basis for shareholder activism is transparency and information disclosure, monitoring of corporate conduct, accountability of the implementation of corporate codes of social conduct as well as internal and external CSR monitoring systems. Especially in the wake of the 2008 financial crisis, corporate governance failures and responsibility deficiencies of market actors have pushed investor calls for transparency of corporate conduct, accountability of shareholder meetings, standardized tracking of proxy votings and accessibility of shareholder meetings. Access to information is believed to lower economic default risks of socially irresponsible corporate

conduct and contribute to SRI trends. Financial market disclosure regulations were installed to prevent future economic turmoil due to financial fraud and principal-agent defaults. As a positive externality of the 2008 financial crisis, the drive towards transparency and accountability within financial markets is likely to foster SRI in the future.

Financial social responsibility also allows investors to attribute causes that are in line with their beliefs and societal values. SRI combines financial investments with personal values based on societal ethicality (Alperson, Tepper-Marlin, Schorsch & Wil, 1991; Frey & Irl, 2002[54]; Sparkes & Cowton, 2004). As a means to integrate ethicality in economic decision making, SRI enables investors to address protected ethicality notions that are in line with their personally held, culturally established social values (Knoll, 2008)[110].

Investment decision making depends on information about corporate conduct. Information on corporate social conduct is a prerequisite for investors’ trust in corporations, lowered stakeholder pressure and litigation risks. Information on CSR impacts on investors’ behavior and triggers financial social responsibility (Gill, 2001; Mohr, Webb & Harris, 2001; Myers, 1984; Siegel & Vitaliano, 2006; Williams, 2005). Investors’ access to information about CSR is a prerequisite for SRI. SRI is based on disclosure of corporate social conduct (Crane & Livesey, 2002[36]; Little, 2008; Mohr et al., 2001). In general, consumers’ knowledge about the CSR performance heightens the positive perception of corporations and triggers investment endeavors.

1.3 Long-Term Sustainable Market Options

As for being incentivized by first mover leadership advantages, more and more corporations may pay attention to social responsibility in the future. Accompanied by followers, the rising supply of SRI in combination with a heightened demand for the integration of personal values and societal concerns into financial decision making may prospectively leverage social conscientiousness to become a standard feature of investment markets. On the long run, the integration of SRI into the overall competitive model will further sophisticate social responsibility in corporate conduct (Schueth, 2003; Starr, 2008; Stiglitz, 2003)[190]. Financial market demand and supply geared towards SRI will stretch the option range in a more socially responsible direction. In addition, if the majority of investors are socially conscientious, socially responsible corporations will continuously benefit from increasing investment streams. Directed capital flows to socially responsible market options will sustainably contribute to CSR and SRI trends (Dupré et al., 2008). Overall, financial markets attuned to social responsibility will lift entire industries onto a more socially conscientious level (Trevino & Nelson, 2004)[199]. As such SRI is attributed

the potential to positively impact on the financial markets and create socially attentive market systems that improve the overall standard of living and quality of life for this generation and the following.

Socially responsible investors fund ethical causes about which they personally care and refrain from ethical infringements. The integration of personal ethics in their portfolio decision making and the perception of the investment decisions being in sync with personal protected values lets investors identifying themselves with their choice (Mohr & Webb, 2005)[133]. The alignment of beliefs and actions evokes identification with investments that grants investors the notion of self-consistency. Self-consistency triggers positive feelings and contributes to the self-enhancement of socially responsible investors (Frey & Irlé, 2002; Schueth, 2003). Socially conscientious investors are therefore likely to stay with their choices and continue to align personal economic endeavors with social obligations and societal concerns (Hitsch, Hortaçsu & Ariely, 2005). SRI leverages into a means of expression of accordance of personal values with societal norms and the wider society, even when market conditions change. Socially responsible corporate conduct attributes long-term perspectives. Socially attentive corporate conduct features sustainability considerations of corporate executives who are mindful of future risks and social impacts of their decision making. Long-term viability of corporate conduct is ingrained in CSR practices. CSR grants long-term stability of corporate conduct as for creating a supportive business environment and decreasing the likelihood of stakeholder pressure and litigations risks (Little, 2008; Posnikoff, 1997; Sparkes, 2002). When taking rising CSR trends into consideration, SRI offers long-term financial prospects (Dupré et al., 2008; Little, 2008; McWilliams, Siegel & Teoh, 1999). Socially conscientious investors thereby use SRI as a long-term strategy to contribute to society and SRI becomes a stable and crisis-robust market allocation opportunity (Knoll, 2008; Schueth, 2003). Using equity funds and for the first time hedge funds, Hong & Jiang (2011) show that stocks with high exit rates consistently under-perform the market throughout the entire 1980-2008 sample, leading to the conclusion that stability pays (Puaschunder, 2016c).

As for longest-term allocation preferences, pension funds are another excellent way to allocate financial assets towards the future. In addition, bonds appear to hold potential to save assets for posterity. An interesting novel attempt to couple this financial sustainability strategy with environmental sustainability is proposed by Jeffrey Sachs (2007, 2014), who proposes to fund today's climate mitigation through an intertemporal fiscal policy mix backed by climate bonds and carbon tax. Bonds are debt investment in which investors loan money to an entity, which borrows the funds for a defined period of time at a

variable or fixed interest rate. Bonds are primarily used by companies, municipalities, states and sovereign governments to raise money and finance a variety of future-oriented long-term projects and activities (Marron & Morris, 2016)[120]. This solution appears as real-world relevant means to tap into the worldwide USD 80 trillion bond market in order to fund the incentives to a transition to a sustainable path (World Bank, 2015). Carbon tax will also be introduced. Sharing the costs of climate change aversion between and across generations appears as important strategy to instigate immediate climate change mitigation through incentivizing emission reduction and provide adaptation (Puaschunder, 2016a). Overall this turns climate change burden sharing into a Pareto improving option over time (Puaschunder, 2016b).

1.4 Demographics

Demographics can serve as an indicator for future purchasing behavior and hence successful industries. For instance, with the baby boomer generation retiring soon and this population segment being an unproportional holder of wealth, one can estimate retirement wealth spending. Industries like tourism but also retirement leisure activities and healthcare are prospectively industries that will be prosperous in the coming decade.

In Europe, migration from Middle East may lead to a demand in respective financial products and certain industries that are specialized on Islamic banking, which appears as successful industry in the future years to come.

1.5 Tangibility

Profiting from insights about your heuristics can either occur through saving or making money off your mental limitations and shortcuts. One way to save or cut on your spending is the realization of different spending patterns caused by the tangibility of assets. Credit cards have been found to dangerously rise spending behavior. A direct implication calls for cautious use of credit cards – e.g., lower the amount of credit cards to one or just using credit cards for paying when necessary such as in foreign sales or electronic transfers. Sharing information of credit card purchases with trusted others may also help by heightened oversight and transparency curbing compulsion.

In addition to this favorable tangibility effect, one may also be aware that the mere presence of wealth may elicit effects in human beings. The behavioral abundance effect shows that unethical behavior emerges in the presence of wealth, potentially through the mechanism envy (Gino & Pierce, 2009). Knowing that, in the eye of a large amount of cash, one may feel envy towards others and may compensate by trying to buy or make up for the depleted self-esteem may cause harmful high purchasing decisions, leads to the advice that one should stay away of the visible proximity of monetary wealth and not carry large amounts of money when going shopping in a wealth abundant area.

1.6 Safe Havens

Similar to casino gambling strategies, in order to avoid falling prey to sunk cost fallacy losses, behavioral financiers should divide any gains and always just use a portion of past gains for future bets. The remainder should be secured in a long-term secured savings option.

2. MARKET COMMUNICATION

Variance in the aggregate stock returns can be attributed to various kinds of news (Cutler, Poterba & Summers, 1988). Estimated one third of return variance depends on macroeconomic news, but market moves also coincident with major political and world events (Cutler et al., 1988).

2.1 Too Much Information

The fear of too much movement: First the speed of market communication may manipulate purchases of stocks. Countercyclical communication times may help avoid people falling for options without thinking twice. A lower frequency of communication may help calm jumpy investors, e.g. a tactic used during the EU Brexit referendum. For instance, some major investment companies reacted to the Brexit referendum outcome by doing fortnightly reporting in order to avoid people to exit their portfolio with the hope to avoid market turbulence and to rebalance the shock.

The fear of too much information also entails what kind of information is shared and the credibility of sources. It is important to focus on information that is timely and reliable and abandon incredible resources for making market decisions. Whose information should be trusted in financial markets? Theories of reputation and herd behaviour suggest that herding among young career novices is more common than with their more matured counterparts (Hong, Kubik & Solomon, 2000[79]; Scharfenstein & Stein, 1990; Zwiebel, 1995). Security analysts are more likely to be terminated for inaccurate forecasts than experienced counterparts, leading novices to be less likely to deviate from the expected. Young early career analysts' career concerns causing young, inexperienced analysts to fall for herding behavior lead to the conclusion to rather trust older, wiser and more mature analysts (Hong et al., 2000; Scharfenstein & Stein, 1990; Zwiebel, 1995).

Strategic trading depends on past market information (Hong & Rady, 2002). Past price development impacts perceived uncertainty of prices as well as the equilibrium feedback to prices (Hong & Rady, 2002)[86].

Cautious investors should be aware of overconfidence in markets. Analysts who are optimistic relative to the market consensus are more likely to experience favorable career moves (Hong & Kubik, 2003). This overconfidence bias of brokerage houses rewarding optimistic analysts exaggerates during market downturns (Hong & Kubik, 2003).

2.2 Too Little Information

The fear of too little movement: As outlined by Hong and Stein (1999), there is underreaction to information on markets, leading to a momentum trading opportunities in markets. In general, stock markets react with delay to information contained in industry returns about their fundamentals and that information diffuses only gradually across markets (Hong, Torous & Valkanov, 2005)[92]. Underreaction mainly occurs in the aftermath of crises or when there is a lot of uncertainty in a market. So while in the Brexit referendum markets at first there was the fear of extreme decisions and the speed of the market was slowed, in its aftermath certain markets stopped trading at all. For instance, the current housing market in London has slowed and almost stopped as for the uncertainty which outcome Brexit may hold in fear of an uncertain future. In times of economic crises, the demand for speeding up the economy may arise. Counter-cyclical policies may aid to speed up the velocity of money within the overall economy.

Information gathering breeds discipline within financial markets and lowers overconfidence biases (Fong, Hong, Kacperczyk & Kubik, 2014)[50]. Security analyst coverage disciplines credit rating agencies and leads to a drop in optimism-bias in credit ratings, especially for firms with little bond analyst coverage and for firms that are close to default. This coverage-induced shock leads to less informative ratings about future defaults and downgrades, and more subsequent bond security mispricings. Even though analysts do not directly compete with credit rating agencies, analyst reports about a firm's equity discipline what credit rating agencies can say about the firm's debt (Fong et al., 2014).

2.3 Social Phenomenon and Leaders in the Field

While news play some role in determining stock market changes, large market moves often occur on days without any identifiable major news releases. Stock price movements are not fully explicable by news about future cash flows and discount rates (Cutler et al., 1988). The standard approach holds that fluctuations in asset prices are attributable to changes in fundamental values. The event study literature has demonstrated that share prices react to announcements about corporate control, regulatory policy and macroeconomic conditions that plausibly affect fundamentals. Several recent studies of asset pricing have challenged the view that stock price movements are wholly attributable to the arrival of new information. Roll's (1984) analysis of price fluctuations in the market for orange juice futures suggests that news about weather conditions, the primary determinant of the price of the underlying commodity, can explain only a small share of the variation in returns. Shiller's (1981) claim that stock returns are too variable to be explained by shocks to future cash flows, or by plausible variation

in future discount rates, is also an argument for other sources of movement in asset prices. Frankel and Meese (1987) report similar difficulties in explaining exchange rate movements. French and Roll (1986)[53] demonstrate that the variation in stock prices is larger when the stock market is open than when it is closed, even during periods of similar information release about market fundamentals. Roll (1984) estimated the fraction of return variation that can be attributed to various news, which explains about one third of the variance in stock returns. Neiderhoffer (1971) analyzes stock market reactions to identifiable world news. While news regarding wars, the Presidency, or significant changes in financial policies affects stock prices, the results render it implausible that qualitative news can account for all of the return component that cannot be traced to macroeconomic innovations (Cutler et al., 1988).

Stock market price expectations develop from news, word-of-mouth and social information sharing. News released to many leads to an expected diffusion rate as the change in the fraction of investors with the news that declines with time. But news initially released to few leads to an expected diffusion rate that initially increases in time and only then decreases. The serial correlation of stock returns and trading volume are proportional to the diffusion rate (Hong, Hong & Ungureanu, 2012).

Diversity of opinions among investors plays a crucial role in models of financial market speculation and bubbles. By using data from China, it was found that investors living in linguistically diverse areas express more diverse opinions on stock message boards and trade stocks more actively. Language barriers slow news diffusion (Chang, Hong, Tiedens, Wang & Zhao, 2015).

Chen, Hong, and Stein (2002) show that entry of investors that have not previously owned the stock is associated with more over-pricing. The exit rate better captures the disagreement distribution of investors in similar fund styles actively evaluating a stock.

Stock market participation is a social phenomenon and therefore highly dependent on the social reference group (Hong, Kubik & Stein, 2004). Economic bubbles develop out of overconfidence, which is rewarded in markets (Hong, Scheinkman & Xiong, 2005; Hong & Stein, 2003). Prices drop on the lock-up expiration date (Hong, Kubik & Stein, 2005). Trading volume appears to be an indicator of sentiment (Hong et al., 2005). While bubbles seem to build up slowly based on word-of-mouth recommendations, market crashes or market downturns are significantly related to days of high trading as investors tend to depend on and learn from signals of their commemorates (Hong et al., 2005; Hong & Stein, 2003). Investor relations are established and maintained for the sake of liquidity securitization (Hong & Huang, 2005). Latent social networks of investors play a role in their investment choices, such stock holdings to investors' linkages but also university alumni connections in that

city play a role (Hong & Xu, 2015). Social influence also become visible in political party affiliations' and presidential election outcomes' impact on financial markets. Party affiliations help predict investment behavior insofar as Democratic investors are more likely to hold or engage in SRI funds than Republican citizens and institutional investors (Hong & Kostovetsky, 2010)[76]. Republican president elections lead to a market up, while President assassinations and entrance of the market country into war in general lead to a market down (Cutler et al., 1988). Political events around the world shape the US market (Cutler et al., 1988).

Macroeconomic news explain about one fifth of movements of stock prices. Most of the macroeconomic news variables affect returns with their predicted signs and statistically significant coefficients (Cutler et al., 1988). Political development affect future policy expectations and international events affect risk premia, which affect pricing. Stock markets react to major non-economic events such as elections and international conflicts (Cutler et al., 1988; Neiderhoffer, 1971)[138].

A sample of events derived from the Chronology of Important World Events from the World Almanac identified if news reports coincident with stock prices (Cutler et al., 1988). Some of the events are clearly associated with substantial movements in the aggregate market. On the Monday after President Eisenhower's heart attack in September 1955, for example, the market declined by 6.62%. The Monday after the Japanese attack on Pearl Harbor witnessed a market decline of 4.37 percent. The orderly presidential transition after President Kennedy was assassinated coincides with a 3.98 percent market uptick, while the actual news of the assassination reduced share values by nearly 3 percent. For the set of events analyzed, the average absolute market move is 1.46 percent, in contrast to 0.56 percent over the entire 1941-1987 period (Cutler et al., 1988).

Certain market industries are predictors of the overall stock market performance. In the U.S. and 8 other international markets, a significant number of industry returns, including retail, services, commercial real estate, metal and petroleum, can help forecast the stock market by up to two months (Hong et al., 2005).

Arbitrageurs tend to amplify economic shocks insofar as speculators holding short positions switch options making highly shorted stocks excessively sensitive to shocks compared to stocks with little short interest (Hong, Kubik & Fishman, 2011). The price of highly shorted stocks overshoots after good earnings news due to short covering compared to other stocks (Hong et al., 2011).

Observations were reported that many of the largest market movements in recent years have occurred on days when there were no major news events. Further understanding of asset price movements requires to model price movements as function of evolving consensus opinions about the implications of given pieces of

information. Propagation mechanisms that explain why shocks with small effects on discount rates or cash flows may have large effects on prices. Benevolence of the subconscious wisdom of markets and the organic whole of the economy embodied in the existing social, economic, and legal institutions should be explored.

2.4 Time of Information

The time of information release plays a role as behavioral finance has found. Trading and returns vary in periods of market closure leading to time variations in equilibrium returns (Hong & Wang, 2000)[93]. There is more trading activity around close and open and more volatility open-to-open returns than close-to-close returns. This effect reflects information piling until the opening of markets that investors want to react to.

Firm announcements on a Friday lead to a less positive outcome on the market than any other days of the week (DellaVigna & Pollet, 2006). The interpretation is that investors are distracted by the weekend and partially forget about the implications of the news (Hong & Stein, 2007). In addition, trading volume is lowered during summer months, assumed due to investors being on vacation (Hong & Yu, 2007). There is a so-called January effect, showing that stock prices tend to rise in January, particularly the prices of small firms and firms whose stock price has declined substantially over the past few years. Also, risky stocks earn most of their risk premiums in January (Thaler, 1987a). Overall weekend, holiday and turn of the month and intraday effects show trading patterns follow calendars (Thaler 1987b).

2.5 Firm Biased Information

Price efficiency plays an important role in financial markets. Firms influence it, particularly when they issue public equity. They can hire a reputable underwriter with a star analyst to generate public signals about profits to reduce uncertainty and increase valuations (Chang & Hong, 2016).

2.6 Medium Bias

Stock markets appear to react to certain media stronger than others, in particular those events which the New York Times carried as lead story, and which the New York Times Business Section reported as having a significant effect on stock market participants. While the New York Times or Times front page is a good indicator of stock moves, the top scientific journals like Nature and Science, are not. What follows is the conclusion that if scientific breakthroughs get first reported in scientific outlets, one may invest in stock of a company holding the copyright or trademark for the innovation and simply wait until the good news hit popular media (Hong et al., 2005)[87]. This may be the result of limited cognitive capacities, time constraints and focused information consumption. In addition, the time of good news release plays a role (DellaVigna & Pollet, 2006)[41].

2.7 Availability Biases

Availability biases may be the underlying cause of peoples' tendency to overestimate the value of their home. People overestimate the value of what they are familiar with and therefore are also prone to trade excessively in potentially suboptimal local stocks (Choi, Hong & Scheinkman, 2014; Hong, Jiang, Wang & Zhao, 2014).

Households hold under-diversified stock portfolios concentrated in firms headquartered near the city where they reside. Explanations for this local-bias assign a causal role for proximity, be it in generating an informational advantage or a familiarity bias (Branikas, Hong & Xu, 2016)[20].

Building on the availability heuristic, excessive media coverage may help to explain extraordinary levels of trading volume in stocks and their elevated prices of so-called overpriced glamour stocks (Hong & Stein, 2007). An example of overpriced glamour stocks is given in the internet bubble period from 1998 to 2000. Overpriced stocks also occur for firms that have local advantages of low competition and risk exposure (Hong, Kubik & Stein, 2008)[82].

The availability heuristic of major corporations being overrepresented in the news leads to declining importance of news for smaller firms (Hong, Lim & Stein, 2000). The underlying mechanism is that information only gradually diffuses among the investment public and this is especially the case for smaller firms (Hong et al., 2000).

2.8 Quality of Information

When it comes to information as predictor of future market performance, open interests as the total number of outstanding contracts that are held by market participants at the end of the day were found to be more accurate predictors than actual future prices in the presence of hedging demand and limited risk absorption capacity in future markets (Hong & Yogo, 2012)[95]. Open interests comprise of the total number of futures contracts or option contracts that have not yet been exercised (squared off), expired, or fulfilled by delivery. Open interest are highly pro-cyclical and correlated with macroeconomic activity and movements in asset prices (Hong & Yogo, 2012).

2.9 Good News Breeding Overconfidence

Classic speculative bubbles are low – price is high and so are price volatility and share turnover; yet be aware, credit bubbles tend to be quiet – price is high but price volatility and share turnover are low as debt is less sensitive to disagreement about asset value than equity and hence has a smaller resale option and lower price volatility and turnover (Hong & Sraer, 2011)[88].

The addition to one of the major stock indices is associated in a price jump for the respective stock, while the exclusion from an index is likely to be followed by a price decline (Chang, Hong & Liskovich, 2014).

2.10 Bad News

In general, managerial outsourcing lowers the performance and incentives of mutual funds by about 50 basis points per year. Fund families outsource the management of a large fraction of their funds to advisory firms. After instrumenting for a fund's outsourcing status, the estimate of under-performance is three times larger. The reason for this effect may lie in the fact that an outsourced fund faces higher-powered incentives; they are more likely to be closed after poor performance and excessive risk-taking (Chen, Hong, Jiang & Kubik, 2013)[30].

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