**TALLINN UNIVERSITY OF TECHNOLOGY**

School of Business and Governance

Department of Economics and Finance

Oumaima Zahouane:

# BEHAVIOURAL FINANCE AND ITS USAGE TO SOLVE POLICY MAKING PROBLEMS: EXAMPLES IN HOUSEHOLD FINANCE

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Supervisor: Pavlo Illiashenko

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Oumaima Zahouane ……
(signature, date)
Student code: 166413TVTB
Student e-mail address: oumaimazahouane@gmail.com

Supervisor: Pavlo Illiashenko:
The paper conforms to requirements in force
……
(signature, date)

Chairman of the Defence Committee:
Permitted to the defence
……
(name, signature, date)

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# ABSTRACT

Behavioural insights have been an interesting field of study for some time now, however their integration into the financial field as behavioural finance and its usage in policy making are still in their infancy. Recent though it may be, its effects have caused ripples in the field as a whole as it shifts from a more theoretical outlook on the world to one governed by behavioural insights, all in an effort to better solve the challenges facing it.

Thanks to multiples tools and methodologies, the application of this field in real world scenarios has been an all-around success, where Randomised Controlled Trials, Cost-Benefit analysis, nudges and so on have become a tool to create policies that better suit the inherent nature of the population. This is clearly apparent in the area of household finance where there is an abundance of examples of how behavioural finance has helped shape policies that improve financial decisions and choices of households the world over in a myriad of ways. Promising results that pave the way for future implementations and developments in this ever-growing field.



Keywords: Behavioural Finance, Behavioural Insights, Policies, Household Finance

# INTRODUCTION

Behavioural finance is a relatively new field that has emerged into the scene of finance as a whole, owing its new found popularity to its mix of traditional financial concepts and the studies of psychology and sociology. An area where it has especially shinned is in the policy making world, where its novel approach to problem solving, focusing on the interplay between human nature and financial decisions and choices, has caused a shift in how policies are not only created, but also tested and validated. Unfortunately, while the aforementioned aspects warrant the interest placed on it by many, and the author of this paper included, the majority of its methodology and concepts remain scattered across a myriad of books, reports and studies, most of which have a singular focus on a very narrow aspect of the field. This regrettable reality has been the main motivation behind this paper, the goals of which are combining and distilling the scaterd information about the topic of behavioural finance and its usage in policy making in general, while at the same time focusing on examples of its usage in solving household finance problems. This was done by going over a large body of literature from a number of varied sources, from academic papers by university researchers, experts in the fields of behavioural finance, policy making and others, as well as reports from renowned organisations such as the OECD and the World Bank. Due to the diverse nature of the information gather, the next step was to organize it and distill it into a coherent whole, by comparing methods discussed and contrasting results and conclusions presented to preserve what was best suited for the desired content of this paper. Content that was then divided into logical parts that make up the different chapters. Over the course of this paper we will discuss behavioural finance and its origin and key points as well as how the behavioural approach to public policy has caused change in the field. With the example of nudges and some of their use cases taken as an in-depth example. We will also give a presentation of the field of household finance as a general use case for behavioural applications and take the problem of retirement savings and the save more tomorrow program as a special example. Concluding this paper will be a summary of the findings on how behavioural finance has impacted policy making as a whole. From all of this work it was quite obvious that tools such as Randomised Controlled Trials

and their ability to easily compare the effectiveness of different policies as well as finding out how various behavioural biases contribute to a given problem are a remarkable aid to policy makers. The same is true for Cost-benefit analysis which can be used to make the choice of which policy to implement much simpler. The way these tools integrate into a policy making work flow allows the application of behavioural finance and behavioural insights concepts and methods seamlessly and efficiently. And the results achieved from this approach in a large number of situations speak for the importance of advocating for a more widespread adoption of it not only to reap its benefits but to increase the pace of research in the field even more.

# 1. Behavioral and household

## 1.1. Behavioral finance

Behavioral finance is a field that has grown and evolved over the years, and while it is difficult to agree on a concise definition of it as a whole, it is easy to see how it shifted from a controversial field to one that has become used in a multitude of areas and with great success, in portfolio theory, corporate finance, option pricing, asset pricing, etc. Not as a replacement to traditional finance but as a complementing field that helps shape decision making the world over. To the point of being part of renowned textbooks like those of hens and rieger and behavioral papers are winning awards and being recognized for their importance. Two examples of this are behavioral portfolio theory winning the william f.sharp award for scholarship in financial research and kent daniel david and avanidhar subrahmanyam being awarded the best paper published in the journal of finance by the smith breeden prize (Shefrin 2007).

This is thanks to its reliance on concepts and perceptions that differ from what is typically used in finance. Most evident, is a fundamental shift of outlook towards the human element and its role in the financial world. It explores this by using methods such as fMRIs, examining wants and needs, preferences and behavior, as well as through data gathered using questionnaires, experiments and insight from the field and by relying on behavioral portfolio theory, behavioral asset pricing models and other concepts. All of this information is handled with special care placed to how it is shaped and influenced by the social and cultural landscape it originated from. Finding parallels with psychology and sociology is a given as the field of behavioural finance draws so much from the two, such as cognitive bias, cognitive dissonance, herd behaviour, hindsight bias, etc. With this toolset behavioural finance tackles a number of challenges and questions, chief among them is the very nature of humans, and their tendency to over rely on behavioural biases in their decision making, most of the time doing so subconsciously, and the way their emotional state can sway their ability to think rationally. This is

compounded by how inconsistent they can be depending on the situation and conditions they are in. Understanding all of these intricacies and using what can be learned from them to get a better grasp of how they affect the way people perform in the financial world, from investors to managers and everyone in between, and try to explain the inefficiencies that arise from this human element as well as how to change the way they behave to try and eliminate or at least reduce these inefficiencies is one of behavioural finance major goals (Phung 2018).

## 1.2. Household finance

The field of household finance is another recent emerging area of finance that focuses on households and their interactions with the financial world. These interactions are born from various needs and desires, and can take many forms. In order to fulfil a household's needs and wants, usually, a monetary flow needs to occur. This can be acquiring goods, paying for services, investments, paying out loans and managing debt. This happens via means such as direct cash transfers, credit cards, checks or online payments and so on. This happens in all households, and seeing this play out in different situations and conditions, as each one of them tries to balance their budget, both in durable goods and human capital, with their desired amount of spending and their degree of risk taking, as well as how unforeseen events, like financial crises, disasters and health problems affect this balance is one of the cornerstones of household finance (Guiso & Sodini 2012).

We can dive a bit deeper into a few of these challenges, such as the difficulty households face when it comes to liquidity and how they generally have a low supply of it, this is particularly the case for young households. We also find that childcare is a large expense in households, especially those with parents in their midlife, what's interesting is that for most households, spending does not decrease by much even after children move out. There is also what is known as mental accounting. An example of it as given by Milkman and Beshears (2009) is through a sort of flypaper effect where customers given a $10 coupon increased their spending by 16% of the coupons value instead of maintaining the same spending amount (Beshears 2018).

This constant game of balance is complicated and can be quite daunting for a large number of households, leading them to either have to educate themselves more on a numbers of concepts and

topics in order to be able to arrive to better results and more beneficial decisions and overcome what can be seen as a form of financial illiteracy that affects the majority of households, else they continue making mistakes and poor choices that may have negative ramifications that can have long lasting effects. To some who may find this too difficult a task to undertake or those who may have amassed a large wealth and have a complex spending scheme, the choice of calling on the services of financial experts or financial products is very appealing as is takes the burden off their shoulders knowing that their finances are properly managed, and this has proven quite popular as these have become a large part of the financial industry. This information barrier that households have to overcome isn't the only hurdle they face, as they also have to deal with generally unfavorable conditions. From the difficulty of accessing credit, the very nature of human capital, which for most households is their main source of income accumulating slowly and being hard to predict and manage, etc. Adding to these are external factors that stem from the financial climate in where these households exist, as well as cultural and historical factors that also come into play. Making generalised, or globalised observations that do not take into account the regional nature of household finance is generally flawed.

One interesting aspect of household finance is how it takes in mind how the general household functions not the marginal ones. So as to have a view that better represents the majority of households, as in those of mostly median income and expenses and with average financial literacy. What is interesting here is when studying households, it is typically found that they tend to follow normative models in certain cases, such as when it comes to choosing a mortgage, while diverging from them in others, as for example when it comes to choices in stock trading. In this aspect we border on the field of behavioural finance as we study the reasons behind the divergent decisions households make even while facing similar problems and challenges and the connection between these differences and the behavioural biases of people, as well as trying to sort these different choices by harmfulness and trying to find which households are more susceptible to making these mistakes the most. In this respect a rather new development in the field of household finance has helped tremendously in creating models that can better mimic the behaviour of real households and help explain observed patterns that previous models failed to cover. This development is the emergence of data, data that tracks a number of behaviours of households, from spending patterns to credit card debt and mortgage payments.

This leads to an interesting topic, which is that of insurance and financial protection, as despite its importance in protecting households from outside factors as well as from their own mistakes born from behavioural biases, we still find that in the real world there's an under reliance on insurances, particularly by those of lower income and financial literacy. And here household finance has recently started making efforts in answering questions such as why households still fail to arrive to good financial decisions even when these mistakes lead to large costs and problems, and try to propose solutions towards creating the basis on which consumer financial protection can develop. A development that would hopefully have a ripple effect that helps grow and mature the financial market as a whole towards one that better serves and protects consumers. And there is still much more to be done, as even newer models aren't perfect and while they may explain one or a few aspects they typically do not account for all the factors that come into play in a given situation. And here trying to take in as much data from as many areas and domains as possible while harmonizing between them while at the same time increasing the cooperation of researchers in the field and minimizing the fragmentation it suffers from is a good way forward. This leave us with the final challenge, which is effectively implementing the findings of household finance research into the real world in an efficient manner and in a way that reaches and impacts the largest amount of people (Guiso & Sodini 2012).

# 2. Behavioral approach to public policy

## 2.1. Changing approach to public policy

The field of economics has shifted and changed a great deal over the years as it went from paradigm to another. This last happened in the 20th century where it went from a literary field to a mathematical one. And now this shift is happening again. As economics become more focused on data driven analysis and concrete evidence and models built from them and less centered on theoretical research. As the proliferation of access to data as well as the speed in which modern tools, such as the internet and the heuristics built-in a large number of products used by people, allow for the collection of bespoke data sets makes it a much more practical tool than it ever was. Among those who benefit

from this shit the most are those in the policy making field. As this data driven approach makes much easier to visualise what is happening in the real world making it easier to use and allowing policy makers to implement laws and guidelines better suited to their target groups, this is in contrast to trying to understand and use complex theories and concepts that generally require large amounts of time and a specific educational background to properly use (Cohen-Setton 2015).

One way of effectively using data in policy making is in order to acquire behavioural insights, whether it be at the beginning of the policy making process in order to achieve an adequate understanding of the group that the policy makers are targeting and the relationship between their behaviour and the goal desired, here usually what is desired is finding the behavioural biases that may need to be overcome or at the very least have their impact minimized. Behavioural insight from data is also used when testing policies on small test groups in order to gauge the performance of them in real world conditions and on real people. This is where policy makers well versed in fields such as behavioural science and finance, psychology, political science and economics can pour over the data gathered and extract from it the most pertinent and important insights to the current task at hand (Matteo M 2017).

An interesting question to touch on is what can be done in situations where it is still difficult to find already gathered data, as is the case in a large number of developing countries here a few strategies are available. One of them is subsidies, subsidies are effective because they generally target products that are consumed largely by the poor. This basically insures their effectiveness. They also have an extra bonus in generally being positively received by the public. And the way they work means the distribute cash to the poor in a non-disruptive manner, without much impact on work as evidence has shown. This also can be applied on products that should be consumed more, such as nutritious food and sanitation products. And a way to make sure these subsidies are delivered to the poor when there is a lack of data on income and financial conditions, as is the case generally in a number of developing countries, policy makers tend to leverage the relative ease of use and large scale deployability of population censuses that query households for verifiable assets such as demographics and material household value. And while this method isn't without flaws, in normal testing conditions the cost and margin of error is worth it for the savings to be had thanks to better distribution of subsidies to those who truly deserve them (Hanna et al).

When there is no financial or logistic barrier in front of data collection, policy makers can employ more advanced, and usually more targeted, methods such as Randomised Controlled Trials in the process of creating policies or for testing their effectiveness. Their usage has greatly increased nowadays and in a number of diverse fields, from medicine, business to international development. As well as being the foundation that Behavioural Insight Teams are built upon. This show their effectiveness in allowing policy makers to find out just how effective a policy is early on in the process as well as being a cheap and accurate way of comparing multiple policies and finding out what works and what doesn't, allowing not only for better suited policies but also saving on precious public budgets. An example of an implementation of RCTs in the educational field could be for finding out the best choice between upgrading current IT systems or pay raises for teachers. This could be done with a three arm RTC, in which one control group will be school that go through no change, and two intervention groups in which we would have school that either receive IT upgrades or where teachers receive pay raises. This would allow us to come to the choice that has the most impact and is most cost effective. In case of policies that have smaller differences, such as for example the choice of a school canteens food layout, small repeated changes while monitoring the reaction and feedback of students until we found as optima a solution as possible is a great example of how RCTs can be used to optimise existing policies. And here an important point to focus on is having a clear goal in mind and being consistent when it comes to examining results for different groups, so to not cloud over data with unclear goals and targets or poorly measured results (Haynes et al. 2012).

Apart from RCTs, another tool in the arsenal of policy makers is Cost-benefit analysis. An analysis method that revolves around the cost benefit rational, which defines a pareto improvement as a policy change that benefits a group at no negative cost for any other. A policy change that is not a pareto improvement can be made into one if the benefiting group compensates the group at loss. And extension of this is a potential pareto improvement, where the benefiting group can potentially compensate the group at loss. By relying on this we can decide whether a policy change is a real or potential pareto improvement or not, by weighing its benefits against its costs, both direct and indirect in order to ultimately decide on whether it is worth implementing or not (Shachter).

An excellent example of how changing practices are affecting the world of policy making is the emergence of BITs, or Behavioural Insight teams. And the best example of these is the original

Behavioural Insight team that started as part of the UK government. And became the namesake of all such teams around the world. Thanks to its expertise in behavioural science, policy making, social psychology, neuroscience and anthropology the team went on to achieve great results that have propelled it to where it is now. As a global company with world leading members from a number of fields and offices in a number of countries as it operates on cases across the globe, all while committing to the further development of the field through its Impact Opportunity Fund. making the team a great example to try and emulate the success of for policy makers all around the world (The Behavioural Insights Team).

## 2.2. Nudge

Nudges are an interesting, albeit controversial, tool to influence the behaviour of the public.
The book nudge refers to people in the decisions making field as "decision architects" that when using nudges can be seen as being involved in a sort of "paternal libertarianism" where they influence the decisions of people without taking away their freedom of choice. And when it comes to economics a good example of where nudges can be useful is the example of saving and/or investing in order to achieve a certain level of lifestyle that can be maintained after retirement. Which tends to be a difficult thing to do for a large number of people (Thaler et al. 2008).

Some of the obstacles that can potentially be overcome via the use of nudges are behavioural mistakes and biases. An example of this is the over reliance on gut reactions and quick decisions, which while they are fast and easy to come to often times aren't the best for the current situation, and just reflecting a little could lead to finding better alternative choices. This is compounded by the inertia of thoughts and habits, where once we make a choice and repeat it a few times it becomes rather difficult to break away from, even if it might be adversely affecting us. As it takes little effort to just maintain the same lifestyle that's shaped by previous decisions and not make the conscious effort to improve it. Here nudges are a great way to make sure, as much as possible, that initial choices are ones that are as good as possible.

Taking this further is manipulating how choices are presented to people. A good way of nudging towards good choices is simply making them being an opt-out option by default, as a lot of people

will simply choose the default options without changing them for various reasons. Another way is to bundle them with appealing options, this way people are more inclined to choose and even put up with choices they might not like at first for the sake of a perceived benefit. These techniques can be made even more effective simply by making sure to eliminate as many obstacles from the choice making process, this can be done by simplification, adding convenience and simply having a discussion with the target individuals and groups to find out what they may want, as sometimes the act of asking alone sparks the process of them thinking of problems and challenges they face that they may not even be consciously aware of. Another useful nudging technique, although perhaps most suited for use with a younger target group, is that of the application of the perception of loss vs gifts. An example of this is awarding students points for academic achievements and good behaviour that count towards certain benefits. Then these points can be taken away in case of worsening performance or breach of rules. This is because humans tend to value the same thing much more if they possess it as opposed to it being a thing to procure.

Another technique that takes advantage of the human nature is nudging feedback which works by simply given people a reason to change by way of given them an insight that compares them to their peers. An example of this can be that of utility bills, where the consumption of a household is compared to the average level of consumption in the neighbourhood, this alone makes it so those who consume more lower their consumption. Although it does make those who consume less than average more likely to consume more. An extension of this is to give people a way to view the evolution of their performance or results, if this is done in a clear and striking way it can be very effective. An example that follows from the previous one is a simple light in the home that glows in different colors depending on electricity consumption, starting out green when it is low and gradually turning to red when it is high. The immediate nature of the response is key to the effectiveness of this method. Another aspect of nudging is relying on how people behave in a social context and how their own decisions are shaped by it. A great way of visualising this is with the example of a music website that has the number of listens next to the title of a song against one that did not. It easily shows how people followed the trend that starts out by just a few people. Monitoring this social inertia and making sure it is generally steered towards a positive influence and finding ways and methods to change its course when it veers towards negative influence can be very effective in improving performance and

behaviour in a number of areas of life that requires a keen and in depth knowledge of the social context that is at play (Thaler et al. 2008).

As can be gathered from these examples nudges can be an effective tool for influencing the choices of people, this effectiveness coupled with their low costs ,versatility and the relative speed with which they deliver results has made them an increasingly appealing tool for both the public and private sector., to the point where countries like the UK now have a Behavioural Insight Team that is referred to as the "Nudge Unit" while in the US you find a similar White House Social and Behavioral Sciences Team. As nudges are used to great benefit, from helping increase saving rates, saving electricity and reducing energy waste, etc. Although these results are remarkable and desirable, they are not in any way an indication that nudges are to be used without focused research and prior planning and preparation, as nudges are designed with a specific environment to be deployed in and a concrete goal in mind, and this is only possible if there is a sufficient amount of data to back up the design choices of the policy makers in charge of making said nudge. A great source that is a great help for creating effective nudges, unsurprisingly, is behavioural science and its extensive and expansive insight on the behaviour of people and what drives their choices in different situations. All of this should then be validated using tools such as Randomised Controlled Trials to make sure that what seems on paper effective translates as planned to the real world and to be able to make adjustments in case it does not (Sunstein, 2014).

# 3. behavioral applications in household finance

## 3.1. Solving the problem of retirement savings: save more tomorrow

The Save More Tomorrow program is an initiative with a goal of making more people save up for their retirement in a way that is simple and sustainable. The program is based on three majors pillars, firstly is creating a conviction in people of saving up more in the future. Secondly is to increase the amount saved when a pay raise is received, this is done to avoid the negative impact a perceived lower spending amount has on people's general willingness to save up more, and finally making the enrollment in the program automatically renew itself, and only by opting out of it can those enrolled exit. This is done in order to make use of inertia. With these three elements the program tries to overcome the natural tendencies of people that act as a barrier between them and effective saving practices. Acting in this case as a very effective nudge, so much so that in 2006 the program became a part of US law under the Pension Protection Act of 2006, with even more employers incorporating it. And this has proved incredibly successful, as estimates show that around 15 million Americans increased their savings thanks to the program (Benartzi).

The importance of such a program cannot be overstated. One of the major reasons for this is simply the increasing life spans humans have started to enjoy in modern times, and while this is an absolutely remarkable achievement of medical sciences and bettered living conditions due to economic prosperity, it also means that an individual will likely require a considerable amount of money in order to be able to live a stable life, especially if they seek to maintain a certain lifestyle. One of the best ways of achieving this is through saving, and here a large amount of people either do not save up adequately, whether it be due to a lack of will to do so, lack of knowledge and awareness of its importance, or simply not being able to save up enough against one's best efforts due to a number of factors (Schuldt-Jensen 2017).

Among these factors is just how loss averse people tend to be, and any loss in spending money due to saving can be a hard thing to accept, even if leads to future gains. This ties in to three other factors, the first is that of self-control, and how it is required to make changes to habits and lifestyle that may come with less spending money, second is simply how procrastination acts as a barrier to change

necessary for saving up for the future. This is made all the more difficult by the third factor, which is just how humans tend to value immediate gains over those to be had in the future. So this combination of loss aversion, lack of self-control and procrastination and the preference for immediate gains is a large obstacle in the face of effective and responsible saving practices. In order to see the benefit of The Save More Tomorrow program and just how effective it is at solving the challenges discussed above a concrete example is perfect. One such example is from its first implementation in 2004. Where a financial consultant met with 286 company employees and suggested a new savings rate that was feasible to the employees as well as recommended by software. Only 79 employees accepted the rate. As for the 207 who refused the consultant proposed to them The Save More Tomorrow program, where their savings rate will go up by 3% every raise, and the next one was four months away. 162 employees out of the 207 agreed to this program. After four months, the first groups saving rate went from 4.4% to 9.1% while the seconds went from 3.3% to 6.5%. What more interesting is that the saving rate of the second group continued climbing, and after their fourth raise their saving rate was at around 13.6%, this is in contrast to the first group, whose saving rate decreased to about 8.8%. This result is a clear indication to how effective the program was, and that is a very good thing, as the need for such a program is very high. As more people are left with defined contribution plans which means that a lot of employees end up with poor savings due to the factors we previously discussed. Making the proliferation of the use of the program a goal worth chasing after (Schuldt-Jensen, 2017).

## 3.2. Other behavioral insights

Thanks to their numerous advantages behavioural insights are enjoying a boom in usage across the globe. Where according to OECD more than 200 government units, partnership and initiatives in different regions of the world are using behavioural insights to solve public policy challenges in field such as consumer protection, environment, public sector integrity, taxation and many more. By supplementing conventional economic theories with behavioural insights, concrete information on how human behavior deviates from ration decisions and choices can be acquired, and in doing so allowing for the creation of more fine-tuned public policies. This has not only helped grow the geographical reach of the use of behavioural insights, it is also starting to broaden the use cases of them as more and more policy makers create policies that target more complex individual behaviours. and even group behaviours (OECD 2019).

The benefits of behavioural insights can be applied to organisations as a whole in order to improve efficiency and performance, by extending the study of individual behaviour to the macro-level of organisational behaviour. As the behaviour of every member of an organisation affects the group actions and decisions, by varying amounts due to rank and positions, such as supervisors and managers having more impact than most low-level employees. Taking this in mind and supplementing it with new methods when the individual behaviour and its impact does not seem to scale as expected is a key way of effectively using behavioural insights in organizational settings (Shephard 2017).

The use of Behavioural insights also goes beyond even the scope of behavioural economics as it encompasses more research of different fields. And while it has made positive change it has also been the target of criticism due various reasons, such as privacy and legal implications (Kaspner et. al 2015). This highlights that while behavioural insights and the various ways they can be implemented does not mean that policy making is now a trivial task, as both the process of designing, implementing and gauging effectiveness and efficiency of a policy as well as the human nature of policy makers that means they too are bound by behavioural biases need to be taken into consideration and the entire process should approached with caution and ample pre-planning to avoid and anticipate as many problems as possible. As well as making sure all of this effort is done in a respectful manner while respecting the fear that some people over the possibility that the libertarian paternalism borne out of the use of behavioural insights does not shift into and undesired straight paternalism (Kuehnhanss 2019).

In spite of these fears, behavioural insights have so far proven to be an effective tool for policy makers, from within public and private organisations to even regional and national governments. Even more global agencies such as development banks are making use of them, such as the world bank. As it has used behavioural insights in a number of developing countries, an environment where they have not seen as much use compared to developed countries that have both the expertise and resources to utilise them effectively. These examples vary in objectives as well, from promoting water conservation in Costa Rica to raising tax compliance in Guatemala as well as improving the development of children in Nicaragua. The bank even created a Mind, Behavior and Development Unit in order to promote the

use of behavioural science in the policy making process in developing countries (Calvo-González et al. 2017).

Another international organisation that is making use of behavioral insights in order to solve a number of problems is the OECD, and in 2017 published a document titled "Behavioural Insights and Public Policy lessons from around the world" that showcases a number of examples of how the OECD used behavioural insights in various situations. A few of these interesting examples are ones such as Improving communication with directors of firms in liquidation, the Australian Securities and Investments Commission (ASIC) took on this intervention from February 2014 to march 2015 with a goal in mind to motivate firm directors currently ongoing involuntary liquidation to comply with legal obligations and report all needed information to liquidators, a task that liquidators sometimes face difficulties with as they interact with the firm directors, either due to outdated contact details or uncooperative directors. In case of this the liquidators will turn to ASIC for help. Who here have made use of a lab experiment that simulated directors of small firms undergoing liquidation, replaced in the simulation by a sample of students in order to find out how to make changes to the letters sent to the directors of these firms to ultimately be able to come up with an effective redesign of the communications that are sent to firms in this situation. This intervention had a positive impact as letters sent saw the number of questions answered correctly jump by about 12% and a clear showcase of how implementing behavioural insights in how these letters are worded results in clear improvements in the cooperation and compliance rate. Another example provided by the OECD was a case in the United States where the Department of Defence and the Social and Behavioural Sciences Team set out to try and encourage more military employees to participate in the Federal government's Thrift Savings Plan. for this goal Pilot test were conducted in a number of army installations, such as in North Carolina, Washington and fort Lewis over the course of five weeks of the spring of 2016. This was done as the department of defence noticed that from 2010 the enrolment rate in the Thrift Savings Plan of civilian federal employees, who were automatically enrolled when they started as new hires, was about 87%, this is in contrast the much lower figure of 44% for military employees, who were not automatically enrolled. And while the situation has changed in 2018 as they will also be automatically enrolled, the DOD sought to find another further solution for the problem. This solution took the form of an active choice on the enrolment in TSP when military employees were changing bases. This alone, after only five weeks of the pilot program made the enrolment rate about 10.7%

and 8.4% at two bases how were part of the pilot program, compared to 1.9% at three other bases that were not part of it. In total it is estimated that the intervention resulted in a 8.3% increase in the likelihood of a military employee to enroll in the TSP in four weeks of the orientation (OECD 2017).

Another interesting use case of Behavioural insights is how Ireland's Economic and Social Research Institute utilised them to find out how the transparency and the framing of the price affect consumers decision making when it comes to personal loans. This was done through two laboratory experiments from summer 2015 to spring 2016. In the first experiment the participants had to choose from multiple pairs of offerings for a 7000 euros loan. These pairs differed by their annual percentage rate (APR) as well as a positive of negative difference in loan term of one or two years. The participants had to make their choices in four conditions where a different combination of information was made explicit to them. While in the second experiment consumers had to make the same choices as in the first experiment but also repeatedly choose one of a pair of loans for a young couple while taking in mind their preferences, this was done after they were given a table that showed how the monthly repayment and financial cost change as a loan term increases. Both of the experiments lead to interesting findings. The first one showed that the differences in information given had a large impact on participant choices, where they were more likely to choose loans that were longer if the monthly rate was discussed explicitly along the APR, while the opposite was true when given the financial cost along the APR, this is compared to when given just the APR or when given all of the information. The effect was quite noticeable, especially for loans with terms shorter than five years. Another interesting observation is how participants preferred longer terms when the difference between choices was only one year, this was not the case when the difference was two years. The second experiment on the other hand showed that providing the example table helped in improving the consistency of the choices participants made, due to them having a better understanding of loans, although this did not affect their tendency to choose longer loans when only given information about the APR and monthly rate. The experiment also showed that participants had a difficult time utilising information on the loans in their decisions, this was even the case in a task such as this where they had to repeat the process a number of time, and they always placed too much importance on the information that was available to them directly, and mostly ignored information that was not disclosed. All in all, the experiments shown a light on just how easily influenced consumers are when making loans decisions, and how the

information presented alone can sway their choices in various ways. Potentially opening a door for nudges created to guide consumers into making better loan decisions (OECD 2017).

In 2013 the German Federal Ministry of Economic Cooperation and Development used a Randomised controlled Trial household survey in order to better understand how formal microcredit affected the financial burden of poor Ugandan households and how to deter over borrowing. The ministry took data from over 1500 households that were borrowers at a formal institution, borrowers at an institution not regulated by the central bank, informal borrowers such as those who borrowed from moneylenders and finally non-borrowers. The ministry also relied on a similar study previously done in Ghana, as well as cooperating with a major microfinance provider in Uganda to conduct interviews with a selected few of its client households that touched on questions such as loans, liabilities and stress events, etc. The study found that the source of loans played a role in determining the likelihood of a household experiencing financial distress. Where those that took loans from non-formal institutions more likely to struggle financially. This was also compounded by the fact that lower financial literacy also meant a higher likelihood of financial distress. This highlights the need for better interventions to better educate the population of financial concepts and provide them with information, especially in saturated credit markets such as Uganda (OECD, 2017).

The Financial Conduct Authority in the United Kingdom sought to find a method to better persuade individuals to find ways to reduce overdraft charges, lower their average balances as well as move to accounts that suit them better and therefore overcome the behavioral biases that consumers have, such as limited attention by relying on their loss aversion. This was done mainly by using data form around 500 thousand randomly selected customers of a large bank in the UK from 2011 to 2014. The Financial Conduct Authority (FCA) mainly focused on how the behavior of people who received their annual summaries differed from those who received them later. As well as how text alerts and mobile banking services affected the behaviour of customers, comparing their behaviour with theirs before they signed up as well as to customers who did not use such services. The gradual rollout of annual summaries created a natural control group of those who have not yet received them. The result of the FCA study showed that the annual summaries had little effect on the behaviour of consumers, while the usage of text alerts and mobile banking apps reduced unarranged overdraft charges by 6% and 8% respectively. Combining the use of both netted the largest reduction of 24%. Although the effect varied by age

groups and income levels. Where younger customers and high-income customers were impacted more by mobile apps while the older customers and customers with mid income more so from text alerts. Overall the combination of receiving automated alerts as well as the ability to immediately act via mobile banking apps helped customers have better control of their accounts (OECD 2017).

Researchers in the Journal of Marketing Research devised a method that helped people have a better vision of their future and therefore influence them to make better saving decisions. The method consisted of presenting participants (n = 50) in a trial with a savings slider, along with this slider was a realistic age-progressed renderings of themselves, these renderings reacted to their choices, where when the participant chose a large amount to save the rendering showed a smiling face, and showed a frowning face when they chose a small amount. This method proved highly effective, where compared to those who did not see the realistic age-progressed renderings, the participants chose to save around double ($172 against $80) in a hypothetical account (Hershfield et al. 2011).

The authors of the Cash by any other name? Evidence on labelling from the UK winter fuel payment studied the effects that labeling cash transfers and cash-equivalents, such as food stamps and child benefits, had on the way people spent them. For that they took the example of the winter fuel payment in the UK, a payment made to households aged over 60. They found that while economic theory postulates that labeling should have no impact on spending choices, the reality of it was the contrary. Where households that were given a cash transfer with a neutral name of £100 spent around £3 on fuel, as opposed to when it was named Winter Fuel Payment, where they spent about £41 on fuel. A large increase solely based on the difference in naming (Beatty et al. 2011).

An interesting field experiment done by authors in the NBER Working Paper in Uganda was that of comparing how different incentives impacted loan repayment. The first incentive was a cash reward received after completing payments, the value of which was about that of a 25% reduction in interest rate on the loan. The second was a 25% reduction of the interest rate of the next loan taken from the bank. And the third was a simple text message reminder that was received each month before the payment was due. Interestingly, the text messages had the same effectiveness as the monetary incentives, especially so on younger customers (Cadena & Schoar 2011).

A study that further expands on this concept of text message reminders, although it predates it, was done by Karlan et al. in 2010 and was also published in the NBER Working Paper. And showed that reminders that had a specific goal were much more effective in changing behaviour than generic ones, in this case on saving behaviour (Karlan et al. 2010).

To better understand how the format in which information is presented affects workers choices in relation to their level of financial literacy Hastings & Tejeda-Ashton (2008) conducted a survey and an experiment in Mexico on participants enrolled in the country's privatized social security system. This lead them to finding that presenting fees in pesos instead of annual percentage rates allowed those with a low financial literacy to better focus on the fees when they choose between different investment funds and therefore chose those with lower average fees. Showcasing just how important the presentation of information can be in its understanding by different people.

To assess the impact of using commitment devices on the saving behaviour of farmers in Malawi brune et al. (2011) devised a test that had had two groups given two different savings accounts. The first group was provided with an ordinary account, while the second was given a so called ordinary and commitment savings account. This account gave its holder the ability to restrict access to its contents until a later date of their choosing. This alone resulted in a large increase in saving for the second group, where this later translated into the farmers of that group purchasing around 26% more agricultural inputs compared to the first group.

In order to encourage households in Norway to make more environmentally conscious and efficient purchases Kallbekken et al. (2012) cooperated with a household appliances retailer to conduct a natural field experiment. This experiment was done by creating and providing labels that showed the total energy cost of a product over the course of its lifetime, as well as by training sales staff. And while neither of these measures ended up increasing the amount of fridge freezers sales, they resulted in around a 4.9% and 3.4% increase in sales of more energy efficient tumbler dryers respectively.

In its 2016-2017 report the UK's Behavioural Insights Team highlighted a couple of examples of how it used it knowledge of human behaviour to influence the choices and decisions of people for the best. One example is how, in collaboration with The UK government's Pension Wise service as well as

three pension providers, the team managed in on trial to increase the number of those who visited the Pension wise website by 10-fold. This was done by condensing the essential information present in the usual 50 to 100 page pension wake-up pack that is usually sent to those nearing retirement into just one side of a A4 paper, this paper also included personalised information on how to access a number of retirement product options and urged the reader to visit the pension wise website (The Behavioural Insights Team 2017).

Another example provided in the report was how the team worked with the Department for communities and mortgage lenders in Northern Ireland in order to encourage people in arrears to communicate better with their banks, this is especially important in Northern Ireland where the 2008 financial crisis had severe effects on the area. The solution developed was the use of simple handwritten letters in coloured envelopes accompanied with handwritten post-it notes. Text messages were also sent to remind people to open their letters. This simple method showed promising early results, with a 35.5% increase in the number of consumers that contacted their bank (The Behavioural Insights Team 2017).

In its following report of 2017-2018, the Behavioural Insights Team also gave an example of how it has cooperated with a third party and used behavioural insights to better guide households towards more beneficial decisions. This example came in the form of its collaboration with Ofgem, an energy regulator in the United Kingdom, to give consumers better awareness of competitive offers in the energy sector that may better suit their needs. In a large-scale trial with about 150 thousand customers, personalised letters that gave the customers information on how much money they could save by moving to a different energy provider, and making this move easier by providing them with the top three deals that were available to them. The results of this trial were quick to manifest, where after only 30 days the rate of switching was tripled from just around 1%. And those who decided to switch after receiving a letter tended to save more on average, about £50, than those who did not and decided to switch on their own (The Behavioural Insights Team, 2018).

There was also a similar cooperation in Australia done with the Australian Energy Regulator in order to encourage consumers to use the government comparison website, Energy Made Easy, after their introductory discounts expire to find alternative energy plans. And by conducting an Online

Randomised Controlled Trial on the Behavioural Insights Team Predictiv platform the best way to write letters to notify consumers was found to headline it with titles that relied on the natural loss aversion of consumers, for example titles such as (You are about to lose your discount) were the most effective in driving consumer engagement (The Behavioural Insights Team 2018).

Via a its Financial Capability Lab partnership with the Money Advice Service the Behavioural Insights Team set out to encourage people to pay more than the minimum repayments monthly in order for them to avoid increasing credit card costs due to interest. This was done by creating an online experiment on the team's Predictiv platform. Participants in the experiment were given one of three sliders to choose their repayment. The first slider was defaulted to the minimum repayment, the second defaulted to a higher repayment and the third gave you the choice of when you wanted your debt to be cleared. All of the sliders shared that they displayed information such as total interest paid and time taken to clear the debt, and these were updated automatically as the user changed their choice. All of the sliders were a marked improvement on systems where the users manually inputted the desired number by themselves. Where the minimum repayment slider increased the repayment amount by 15% compared to the control group. The higher repayment slider increased the repayment amount by 20% and finally the time to clear debt slider increased the repayment amount by 22%. The change also manifested in a significant drop in those who chose the default repayment amount in all slider cases (The Behavioural Insights Team 2018).

# CONCLUSION

The aim of this thesis has been to present prevailing trends that are being implemented to help with solving problems and issues that face policy makers around the world. We have shown that effective use of behavioural insights and finance alongside tools such as RCTs and cost-benefit analysis, as well calling on the services of behavioural insights teams to create policies that are a better fit for the social and financial climate they are to be implemented in is very beneficial. With positive results in a number of fields, small scale such as in schools and neighborhoods to large scale, from organisations, cities and even countries. We have also presented real world use cases in areas such as promoting better savings practices and less energy waste and many others that showed tangible improvements in the behaviour of people. All in all, both the logistic and monetary cost of utilising behavioural insights in policy making and the benefits brought by them overall taken together paint a very promising picture that is not affected much by the rather short list of complaints against them. As the world continues to grow and their usage spreads more and more, especially in developing countries both the amount of results, as well as surely the amount of research done in this field and its applications will grow and evolve to meet the demand and shape the policies that will govern the world of tomorrow.

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