Financial capability and interactivity in a Money Museum – Economic psychology in the Brazilian Central Bank Money Museum

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This paper describes the on-going project to implement an interactive museum centre of reference in economic psychology and financial education (NUMIP, in Portuguese) at the Brazilian Central Bank Money Museum. The project aims to disseminate information from research in economic psychology to the population, as well as offering tools and opportunities to discuss applications in the realm of economic behaviour, decision-making and policy-making. It will also integrate the National Strategy for Financial Education, and its pioneering approach is based on the assumption that technical information alone seldom reaches the objective of conveying these notions to the intended recipients. For this purpose, a wide array of resources will be used, such as games, sketches, testimonies, experiments and collective building-up of choice architecture strategies, as well as the regular literature. Topics addressed include biases and systematic errors in decision-making, in areas such as credit, over-indebtedness, saving, pension plans, overconsumption, sustainability, financial fraud, inflation and interest rates. For the Brazilian Central Bank, NUMIP is an important opportunity to improve communication and interaction between financial experts and the general public, while offering a meeting point for researchers, not only in Brazil but in other countries, which could also establish their own centres following this initiative.

1. Introduction - the general background

The Brazilian Central Bank Money Museum (MVBCB) has been concerned with the education of its visitors at several related levels, having economic, monetary and financial education among its main goals. Over the past few years, however, financial education initiatives have begun to undergo serious scrutiny by specialists who have been questioning their true efficacy regarding actual behavioural change towards greater financial capability among the population. One of the issues raised addresses the outbreak of the major economic and financial crisis that started in 2008 in many different countries, particularly those that had already launched national programs in the area, including the US[1] and UK[2].

One question then emerged, whether financial education programs could avoid crises such as that in 2008, which have such long-lasting deep impact over the whole world? Could information reduce excessive optimism and self-confidence, two of the main culprits in the bubble formation, or control herding behaviour, that was present both during the inflation of the bubble and in the panic that followed its bursting? Researchers coming from the intersection of psychology and economics argued that technical information alone is seldom able to attain the goal of helping people achieve financial capability, due to the interference of several emotional and cognitive biases

[1] *Taking ownership of the future* (U.S. Department of the Treasury, 2008) – the programme began to be devised in 2004, and took shape in 2006 - http://www.treasury.gov/about/organizational-structure/offices/Domestic-Finance/Documents/Strategyeng.pdf

[2] *Financial Capability in the UK: Establishing a Baseline* – http://www.fsa.gov.uk/pubs/other/fincap_baseline.pdf; *Delivering Change* – http://www.fsa.gov.uk/pubs/other/fincap_delivering.pdf

present throughout the process of analysing data, which routinely results in judgment errors and inadequate choices in the end.

The question then narrows to why it seems to be so difficult to change behaviour and increase actual financial capability. Moreover, according to traditional economic theory, individuals would always try to choose what is best for themselves, and should be able to learn with their experience. Nevertheless, there is a pattern of mistakes in economic and financial decision-making, regardless of cultural and educational background, age, level of intelligence and other aspects. The answer appears to lie in the limitations of mental operations involving the process of perceiving and assessing data that try to choose what is considered to be the best alternative, but often having *anomalies* (economic phenomena that cannot be explained by traditional economic theory) as a result, instead of successful choices.

These rather common instances of puzzling behaviour – the decision-maker intends to get it right, but winds up choosing unfavourable options for him/herself – have been studied by economic psychology for over 130 years and, more recently, by other related disciplines as well.

2. Economic psychology and financial education

Economic psychology is a branch of social psychology, in the intersection of economics and psychology. It questions full rationality in human psychological processes, and researches economic behaviour and decision-making among individuals, groups, populations and policy-makers. Studies may cover areas such as saving, credit and debt, investments, household financial decisions, economic socialisation, taxes, economic crises, rationality, sustainability, scarcity, gambling, intertemporal choices, risk and uncertainty, and naturally, the psychology of money, among others.

From the 1980's on, other disciplines have come to join the same intersection: behavioural economics, behavioural finance, neuroeconomics and applied behavioural science. They take an interdisciplinary look at emotional and cognitive biases that impact data perception and judgment, and how they impair optimal decision-making. There is plenty of literature on experiments and surveys designed to empirically study these issues, for which three researchers have already been awarded the Nobel Prize of Economics: Herbert Simon, who was both an economist and a psychologist, in 1978, for his theory on bounded rationality, Daniel Kahneman, a social psychologist, in 2002, for prospect theory, and Robert Shiller, an economist, in 2013, for his studies on financial markets, especially regarding bubbles.

Having collected such a large body of knowledge on the psychology of decision-making, economic psychology can prove to be a relevant ally as far as financial education initiatives are concerned, helping to diminish the enormous gap between intentions and actions, so often found when people plan to do whatever is best for themselves, but have trouble carrying this out regarding decisions involving money and other scarce resources. It was for this reason that the NUMIP project has been proposed to the MVBCB, in order that the original Museum's goals could be further achieved.

Living in a complex world, where complex economic and financial decisions must be constantly made – organising budgets, making ends meet, taking loans, forming families, buying homes, investing, planning for retirement and so on – individuals,

households, organizations and policy-makers are often challenged by their own limited abilities to deal with these. They have trouble with selective attention on one hand, and unfavourable contexts on the other, while feeling highly susceptible to both social pressure (as in herding behaviour, for instance), and to that coming from their own impulses and emotions. As a result, data are perceived, remembered and assessed in biased ways, as people try to simplify these processes as much as possible, as otherwise they might be felt to be overwhelming.

However, simplification reduces accuracy, even if there might be gains in speed and immediate handling of situations. A less precise apprehension of the world may indeed induce inadequate choices and errors despite the permanent – and indisputable – general wish to always succeed. Hence economic psychology informs, among other things, that: our choices and behaviour are often inconsistent; groups have a strong influence over individual behaviour; determining risk is a very difficult task, and awareness of this shortcoming is often missing throughout evaluation of perspectives; there are routinely problems such as self-control, planning, inertia, procrastination, distractions and (bad) habits; the mind faces constant conflict between emotion and reason, or as has come to be known, the *hot self* and *cold self*, or alternatively, between *System 1* and *System 2* (Tversky & Kahneman, 1974; Kahneman & Tversky, 1979; Kahneman, 2002, 2011; Thaler & Sunstein, 2008). As a result, "systematic mistakes" are made, and they are so named because most people incur them most of the time, in similar ways, in such repetitive pattern, that they can often be predicted.

Examples include: difficulties triggered by *intertemporal choices*, where immediate gratification is routinely preferred over considerations around the long range, regardless of the consequences following such option; these problems may also turn worse, with the all too common *hyperbolic discounting of time* that comes along with intertemporal choices, and points to a rather groundless belief that all that is not being done now (due to lack of discipline, self-control or general incapacity), will easily be achieved and get promptly done *tomorrow*, thus perpetually postponing and never really taking any action (because all the action will take place tomorrow!); *mental accounting*, where, contrary to traditional economic theory, money proves not to be fungible, and is spent differently according to the label received or the shape it comes in (for instance, it tends to be more easily spent when cards are used as opposed to cash); *framing*, which indicates that the way information is presented has a major influence over what is chosen, as in the case with prices such as $1499.99 preferred over the nearly identical $1500.00 because the former *looks* – or *feels* – less expensive than the latter.

There are at least two dozen other examples, and this great vulnerability to biased data analysis may be explained by the fact that there are permanently two different mental systems operating in our mind, as mentioned before. *System 1* or the *hot self*, is responsible for fast automatic reactions and passive experience, such as in the case of perceptions, feelings and associations that come by effortlessly and cannot be controlled. This instance is also responsible for acting, as it is the one present when execution is to take place. However, one of its greatest shortcomings is near-sightedness, that is, it can only consider the short range and more pressing matters. *System 2*, or the *cold self*, on the other hand, is the deliberate side, able to reflect over matters more carefully – and slowly, too – as it is capable of seeing the whole picture more clearly, taking the long range perspective and likely consequences into consideration; it is also the part of the mind responsible for planning, and usually holds

the best intentions about future choices and actions. Nevertheless, when the time comes for acting, it will not be there, its place having been taken by *System 1*, that is far less competent for deciding when this requires thorough examination (on the other hand, for several automatic routine actions, *System 1* is quite suitable and accomplishes these tasks satisfactorily).

However, when serious economic and financial decisions are at stake, it would be wise to resort to *System 2*, although this instance, like human beings in general, is far from being fault-proof itself – yet there is little doubt that it may lead to carrying out more adequately tasks that require deeper concentration and tighter self-control.

Therefore, financial education must address the following challenge: educational programs have little trouble reaching *System 2*, and may in fact have people change their views, plans and intentions about future decisions, although not necessarily their behaviour. In other words, *System 1* remains quite out of reach in this respect, since learning is not one of its skills (automatic training, on the other hand, is). Besides, the quick grasping of information and automatic responses typical of this latter system is likely to fail in changing actual behaviour, *i.e.*, the person chooses whatever it was he/she originally intended, instead of repeating the usual automatic response to that situation. This explains why the addition of psychological insights to programs would be most welcome for the process of achieving greater financial capability.

Besides, economic psychology and financial education do share a similar goal, namely that of helping citizens improve their economic and financial decisions, and choose more responsibly and autonomously. Since behaviour is necessarily at stake where education, learning, communication and changing habits are concerned, financial education programs ought to go beyond purely technical information on finance. This is important, no doubt, but in addition to that, they should address how people actually process information and the operations carried out by the automatic mental system, that is, impulses and emotions, *System 1*, or the *hot self*, and *groups* as well because these are the actual doers when the time comes to act.

3. Origins of the idea and assumptions underlying the project

NUMIP, the interactive museum centre of reference in economic psychology and financial education to be implemented at the MVBCB, is the result of a partnership between IAREP, the International Association for Research in Economic Psychology, and the MVBCB, established in 2010, and actually started in 2013. The idea was originally conceived in 2009, when I saw a presentation about MIDE, the Mexican Interactive Museum of Economics (Museo Interactivo de Economia), at an OECD financial education conference in Rio de Janeiro, Brazil, and thought that a lower-key version addressing economic psychology instead could be a helpful tool towards financial education in the country.

Inspiration has come from two other Brazilian interactive museums as well, both of them located in São Paulo: the Museum of the Portuguese Language (Museu da Língua Portuguesa), that introduces issues around the language by means of stimulating formats, and the Person Museum (Museu da Pessoa), a simple however interesting initiative that allows ordinary people to tape personal life stories in video, which are then made available to the public on their website.

Bringing economic psychology content to NUMIP will comply with the conditions described below:

- **Interactivity** – visitors should have the chance to go through direct daily life experiences related to their mental dynamic as much as possible, particularly regarding decision-making processes, with opportunities for self-observation and further learning about people's own behaviour, which may increase the chances for gaining insights into it. There should also be the possibility for recording testimonies about people's own experience regarding economic decisions (for instance, strategies used for saving, problems with debt, vulnerability to fraud, and living with inflation, a serious problem in Brazil not too long ago), that then become part of the collection, remaining available for other visitors who could also comment on them, thus keeping NUMIP permanently updated;

- **Dissemination of economic psychology** – although this area has been a research line at European universities as well as in other countries too (and along with behavioural economics and finance, neuroeconomics, decision or behavioural applied sciences, gained greater impulse and visibility after the major economic crisis burst in 2008), there is not to date any specific centre exclusively dedicated to economic psychology; an interactive centre such as NUMIP would come to fill this gap. In this respect, it might attract researchers from other countries, people interested in the topics investigated by it, and policy-makers willing to use these insights, as this kind of cooperation between the discipline and the public sector is beginning to take place (in Brazil, besides contributing to ENEF, the National Strategy for Financial Education, and this current project at MVBCB, economic psychology has also been part of the Brazilian Central Bank financial inclusion agenda since 2010 and is one of the Bank's principles for better practices for financial institutions regarding the use of credit; CVM, the Securities and Exchange Commission of Brazil, is also to start a centre of behavioural studies to support their financial education initiatives for investors);

- **BCB Money Museum appreciation** – with the Money Museum to host this pioneer innovation as far as collection and strategies go, it is expected that it may become a relevant reference, also unique in all these segments: economic psychology, financial education and money museums at Central Banks, both in Brazil and abroad;

- **Collective construction of the project** – although the author has had the initial idea to create an interactive museum centre of economic psychology in 2009, the original project has been modified and enhanced by means of rich cooperation coming from within the Central Bank, where the museum team has had a major role discussing its format and studying feasibilities, helped by the financial education department, along with economic psychology study groups that I have coordinated which have worked on crowd-sourcing and offered several precious insights;

- **Sustainability** – since NUMIP is dedicated to improving decision-making among individuals, groups, governments and populations, through knowledge, awareness and direct experience of systematic errors, it follows that it must display a strong concern over careful, deliberate and sustainable choices; in fact, this is bound to be its main core. As a result, its proposals ought to express this purpose and, instead of grandiose approaches, simpler low-cost, yet ingenious and attractive solutions are to be sought so as to provide a different kind of interactivity, namely less the hi-tech with all its

electronic devices, special lighting and expensive screens, but instead have a greater focus on creativity, since this is a crucial skill in life and for dealing with finite resources in particular.

4. NUMIP: purposes, goals and collection

a. Purposes

Since museums are associated with cataloguing and collecting both objects and concepts, the MVBCB may well encompass Numip and its collection, while addressing the following purposes:

- Within the realm of economic choices, that is, those involving finite resources, such as money, time, attention, natural resources and others, bring together information about *heuristics* that are the fast however less accurate ways to analyse and assess perspectives throughout decision-making, when essentially emotional features and impulses are at the core of this process, rather than more precise careful judgment of data; with heuristics lying so far from being perfect, resorting to these mechanisms is likely to bias decision-makers, and therefore increase their chances of making *systematic errors*.
- Inform citizens about decision-making from a psychological point of view, both as individuals and as social groups, while encouraging interactivity so as to promote awareness and empowerment along with debates over *choice architecture*, a new research line within the discipline that aims to design contexts that are as fool-proof as possible, based upon visitors' contributions that may eventually become a collective construction of *antidotes*, that is, strategies to counter the faults produced by heuristic-based data judgment while making decisions.
- Establish a source for new studies and stimulating exchange between researchers, policy-makers, students and other collaborators.

b. Goals

In summary, NUMIP's final goals are to:

- Protect individuals, groups and organisations from mistakes while analysing data and making decisions, by means of offering them tools for better handling their economic choices with responsibility and autonomy;
- Disseminate warnings on psychological traps in mass scale;
- Contribute to micro finance initiatives;
- Debate choice architecture and *nudges* (simple low-cost however efficient context-designing to favour less faulty choices);
- Become a think tank by providing content and strategies to policy-makers and other relevant agents, while offering opportunities for decision-makers to reflect upon, debate and build alternatives towards more favourable economic and financial decisions.

c. Collection

The collection may include items such as:

- Basic notions about economic psychology, mental functioning and decision-making, along with practical examples of bias and systematic errors;
- Brazilian and international academic and scientific production on economic psychology, encompassing theses and dissertations, journals and books, both in print and in electronic format;
- Interviews, testimonies and stories told by visitors;

- Psychological "antidotes" against systematic errors (for example, if one is broke, and upon learning that we tend to spend less when using cash, a possible antidote would be for a period to leave credit cards at home when going out, and take only cash along until financial balance is regained);
- Choice architecture examples;
- Suggestions for policy-making;
- Games, sketches, music, soap operas;
- Internet-related content, such as videos and podcasts, and links for other relevant websites;
- Research, experiments, debates, symposia and workshops;
- The history of the discipline as showed in a timeline.

The collection is to be permanently increased by users and specialists, who would constantly add new information and data, turning it into an updated tool for psychological-economic orientation for individuals and groups.

5. Final remarks: the relevancy of the project

In addition to the challenges described above concerning financial education initiatives and behavioural change, Brazil has faced some extra ones over the past few years. The country has never had a strong savings tradition and for several years had to deal with extremely high inflation rates (these peaked at 80% in a single month, twenty years ago). Nowadays, currency has been far more stable, but new problems loom in the horizon with excessive consumption, little or no control over personal finance and, in some cases, serious problems with debt. Innovative financial education initiatives are, then, more than welcome in such a scenario.

Given the mental limitations displayed by decision-makers described above, different strategies must be devised in order to go beyond the sole presentation of technical information and advice, and in fact aim at *debiasing* individuals and groups, that is, try to reduce their vulnerability to systematic mistakes, as shown in some of the examples previously presented. There are no final answers or definite findings in this respect, so the establishment of a reference centre like NUMIP could stimulate new research and potential sharing and partnerships involving Brazilian and foreign researchers, with dissemination of ideas, data, discussions, further academic production and debate over policy-making.

At the same time, NUMIP aligns with the Brazilian Central Bank's strategic goals of improving communication and the relationship with the public, plus strengthening international insertion, while also contributing to its mission of keeping monetary stability. A pioneer initiative at money museums, central banks and in the realm of economic psychology itself, may help to improve financial capability, awareness, empowering and emancipation towards more favourable and sustainable decision-making among the population. In 2014, a pilot version of the project is to be implemented with videos, testimonies and games, and its final format is in the process of being defined.

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