

Increasing Financial Literacy: A Public Policy Challenge

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I. Political Backdrop: Limits to Public Insurance Schemes

For more than a decade now, the potential and frequently simply alleged relative flaws in public sector – collective – pension schemes have been exposed in the public debate. The core case against pay-as-you-go systems being that, in order to cope with population aging, their underlying parameters – contribution rates/payroll taxes, replacement ratio or normal retirement age – have to be altered. This implies, evidently, a reduced expected income stream for future retirees. Concurrently, as an apparently logical corollary, these parametric adjustments entail an underperformance in terms of expected returns compared to funded systems. The latter are frequently equated with individual or privatized accounts. However, this relative underperformance is not so self-evident as it appears at first blush. Nonetheless, it is a general perception in many OECD countries after more than a decade of debates and reforms.² In any case, individuals are ever more called upon to take care of their own affairs. That is, they are assumed to significantly provide on their own

¹ The authors would like to express their gratitude to Frank Welfens for very able support. Errors, however, are very much our own.

² While this is not the topic of our paper, funded systems as well pay-as-you go systems are essentially options, that is, contingent claims on an output still to be produced. The return of a pay-as-you go system should be roughly equivalent to the growth in employment plus the annualized gains in real wages, i.e., for given factor shares, to GDP growth. A funded system, on the other hand, should produce returns, gross of fees, roughly in line with real interest rates, i.e. approximately the marginal efficiency of capital, which, again in equilibrium, cannot deviate too much from GDP growth. Paul Samuelson has been the first in 1958 to emphasize this equivalence. Pay-as-you go system will, however, as an inexorable consequence of the first generation of retirees receiving benefits far in excess of contributions, show lower returns. But then, net returns on privatized accounts, after management fees, sales expenses etc., are substantially below gross returns (see for example *Diamond* (1996)).

for a decent standard of living during their ever longer years of retirement, at least in a complementary way.

In addition, further mechanisms of collective insurance (protection against health risks or job losses, for example) have been cut back, again necessitating supplementary contributions – self-insurance – on the part of individuals. However, while responsibilities delegated to private households have been increasing substantially, their capacity to cope with the new challenges is, on average, still barely up to the task. Even more problematic, significant minorities, in particular those most deserving, are even less adequately equipped with the required basic knowledge. This creates a climate of unease and concern, even angst. And it makes quite a number of them vulnerable to either mis-selling or to being shocked into doing nothing.

Against this background, doing something against the palpable want of financial literacy (and numeracy) in the general public – as, for example, comprehensively documented in the OECD's study on *Improving Financial Literacy* – has risen on the policy agenda. In order to support those efforts, the EU Commission held in late March 2007 a conference on *Increasing Financial Capability*. To reiterate, this lacking consumer sovereignty is seen as a problem since, concurrently, an ever stronger emphasis is put on individuals to self-insure against potential threats to their well-being.³ The simple observation that central banks as well as numerous other public sector institutions increasingly acknowledge the fact that individual investors' agency in affairs financial should be nurtured bears witness to the growing importance of this subject.

In fact, a large number of monetary authorities has responded early on to these challenges. They could have rationalized this activity from a purely monetary perspective, that is, through financial literacy's potential impact on the efficiency as well as stability of financial markets, and thus on the transmission of monetary policy. But, chiefly, central banks justified their involvement less indirectly: that is, they unequivocally declared their intention to foster consumer welfare. Consequently, central banks did and do interpret financial illiteracy as a policy issue in need of remedial action. This holds true, for example, for the U.S. Federal Reserve, which propose a whole series of programs addressed at a general audience. It is as well the case with literally all central banks within the

³ Our paper is partly based on the first author's introductory remarks to this conference – which, again, build on both authors ongoing exchange on these issues.

European System of Central Banks – visiting the respective homepages produces sample confirming evidence.

As concerns the Deutsche Bundesbank, it has been engaged in economic and financial education for at least three decades. In other words, it understood and understands supporting the individual capacity to deal responsibly with financial and economic affairs for meanwhile a long time as an important part of its activity program, its duties as a public servant. Through its publications (in particular the *Monatsbericht*) the Bundesbank informs the public debate on a broad range of topics. In the same vein, it has produced numerous brochures and booklets, targeting separately students as well as teachers, who use this material rather actively for learning or teaching purposes. Moreover, it does engage in many teaching projects, frequently visiting schools or universities.

In our eyes, therefore, raising financial capacity is indeed of the essence. And it has gained in importance over the last decade against the briefly alluded to changing economic and financial environment. In this note we will sketch three points in a broad brush way, that is, address the why, the how and the perspectives or further works on financial literacy. In other words, we will try to provide a succinct overview on challenges to reasoned financial agency and what classical finance would suggest tackling them.

II. Raising Financial Capability: A Project of Enlightenment

Consumers should be financially literate in order to make better investment decisions. This is the Why-dimension in a phrase. Hence, the very task is to enable people to make choices in their own best interest. Fostering this capacity is at the same time the probably most effective device to underwrite investors' protection, to cope with their vulnerabilities. And investors' education, this means in particular numeracy, is especially relevant in light of all long-term funding or investment projects. To control one's future responsibly one has to develop the capacity to take care of one's own financial affairs.

Moreover, as a normative observation, we would like to emphasize that developing a reasoned judgment on financial issues has, in addition, more than an individual dimension. It quite obviously concerns societal well-being as well, by impacting, for example, on all the financial issues – from the regulation of investment funds to securities markets to corporate governance – on which the political process deliberates (see Kotz

(2007)). Politics benefits from a knowledgeable constituency, a reasoned public discourse.

It is here where, quite logically, the notion of enlightenment comes in. In the early 1780s in his famous essay on: “Was ist Aufklärung?” Immanuel Kant wrote that “enlightenment is the escape venue of man from his self-inflicted incapacity to judge.”⁴ While as economists we – almost tautologically – assume that consumers know, or more precisely, do what’s in their own best interests, this is in financial affairs palpably not always the case. Financial literacy tests, as reported for example in the (already quoted) OECD study, produce quite unambiguous evidence of investors’ incapacity to put a consistent judgement on financial issues. Four important results are generally found in such studies: (1) Responses to knowledge questions show that too many individuals have difficulties with rather basic financial issues. (2) Conversely, respondents are usually (too) confident, assuming to know more about financial matters than is actually the case. (3) At the same time (and somehow in contradiction to the point mentioned before), respondents find financial information difficult to obtain as well as to evaluate. (4) Finally, financial literacy seems to increase with education and/or income.

Incapacity to judge comes at a price. As research in various areas of behavioral finance shows, financially illiterate investors are more prone to investment biases and they enjoy significantly lower returns (Grinblatt and Keloharju (2001), Shapira and Venezia (2001), Dhar and Zhu (2006), and Brown, Chappel, da Silva Rosa, and Walter (2007)). Again, as individual biases could also translate into general or overall market outcomes (e.g. Daniel, Hirshleifer, and Subrahmanyam (1998, 2001) or Barberis, Shleifer, and Vishny (1998)) or impact social welfare via the social security systems they are not only a private but also a social problem. Keeping this in mind, public counteractive measures can be justified. Such interventions, accounting for spill-over effects or externalities, are not unlike merit goods with which “society undertakes to correct for failures in the process by which individual choice is implemented effectively” (Musgrave and Musgrave (1989), p. 57).

⁴ Published initially in 1784 in the *Berlinische Monatsschrift*, here quoted from *Was ist Aufklärung?*, Reclam Universalbibliothek, no. 9714, Stuttgart 1974, p. 9 (our translation).

III. Ways to Enhance Financial Literacy

But how should one nurture financial capabilities? The most natural way to contribute to financial enlightenment is of course to start early. Therefore, it should be a primary concern of schools. But adults, quite palpably, need support as well. Financial education programs for this audience should focus on difficulties as experienced in situations where individuals are confronted with a choice between complex products or have to decide – and follow through – on a long-term savings plan.

In practice, one does observe two basic approaches which orient the attempts at bringing financial literacy to children. One is to develop a stand alone, specialized course in economics which makes students aware of its foundations and supplies them with the tools to understand real world issues. In the German case, with education being a prerogative of the Länder, like in the U.S., this is a line of attack quite frequently taken. It is, however, mainly the higher grades (9 to 13) in which classes in politics and economics are taught. But, quite clearly, vulnerabilities afflict children much earlier – enormous mobile phone bills are a problem for too many of them in very low grades already. Hence, insofar as domestic education does not suffice and in order to deal with these concerns, appropriate teaching support is called for from almost the beginning of children's schooling.

Here we would like to emphasize a further, possibly only supplementary approach and possibly concerning later grades mainly: Since finance (like computer literacy) has a substantial horizontal dimension, one might as well think of introducing economic cases in a number of different courses. For example, because math and statistics are of the essence, finance lends itself very nicely to enhancing students' interest and capabilities in those subjects, otherwise frequently perceived as a bit tedious. For example, a solid knowledge of interest rate compounding – obviously too frequently lacking according to most financial literacy tests (OECD (2005)) – is an indispensable prerequisite if one wants to have an informed evaluation of a loan contract or put a judgment on a promised stream of returns. In many circumstances, financial topics thus could be integrated very fruitfully in math classes, in fact making them more interesting and ultimately valuable for students. Then, in those classes where the basics of probability are taught, data on returns provide a particularly good motivation for the study of expected value, standard deviation as well as all sorts of sample biases. In our view, the 'underlying' subjects would not be hijacked by an extrinsic, impure field. To

the contrary, their teaching and understanding could be substantially enhanced.

This holds true for a number of further traditional school courses. Most evidently, in order to develop an appropriate understanding of many questions in history or social sciences, taking an economic or financial perspective is advantageous. But, interestingly enough, economic and financial topics do come up as well in more pure fields like literature. From a certain angle, Balzac's *César Birotteau* is about an individual pension funding and wealth allocation problem – dealing with financial mishaps and, admittedly, other disappointments. Maupassant's *Bel ami* takes on questions of a changing financial infrastructure – with the, at that time new, concept of a *Universalbank*. Or Emile Zola's *L'argent* is (of course only partly) a marvelous description and explanation of the functions bourses perform.

We could go on easily. But one should be aware of the critique that it would make for a very poor reading of these authors if one would mainly take note of the finance dimension. Nonetheless, such a perspective could foster a deeper understanding of literary questions. In any case, the suggested method of teaching, appropriately applied, would support financial literacy. It would, of course, concurrently call for new didactic and pedagogical approaches. It would also imply an updating of teachers' education programs. This, to our minds, is at a minimum a sensible venue to ponder.

Apart from efforts at the primary and secondary school level, there is quite obviously as well the issue of increasing financial capabilities of adults. Numerous institutions, e.g. Volkshochschulen, consumer protection associations as well as financial service providers (and their associations), already subscribe to this effort with a broad variety of initiatives. While all this is useful, we do see here, however, a substantial public good dimension. (This is, to repeat, a perspective which is shared by many public institutions, amongst them central banks.) With regard to the average or representative agent's capital allocation issues such efforts should be focused on bringing home the key – and at the same time: rather simple and therefore practical – insights of classical finance. The two most important being: “You can not beat the market” (with the corollary: “And you'd better not try.”). The second principle: “Higher expected returns, unfortunately, come inexorably only with higher expected risks”. Being aware of these empirically robust insights would put individuals in a much better position when communicating (con-

structively) with financial advisors or to understand and decipher marketing efforts from the financial industry. We will elaborate on some of these points in the next section.

IV. Issues of Financial Literacy – Three Examples

The management of risk is the primary subject matter of finance. Accordingly, containing its potential negative consequences has been high on Finance's research agenda. As an upshot, we now do have a reliable body of empirical and analytical knowledge. Even more practical: there are tools available for individuals and households to cope with potential threats through applying techniques borrowed from probability statistics in order to contain disappointments or minimize regret (Shiller (2003)).

In particular, we do have instruments, very much workable on an individual level, which could support households effectively in their choices for bankrolling their retirement years. Some of the analytical concepts, as developed in Finance, are very much in an enlightenment tradition: That is, they are about debunking myths – almost routinely rendered as conventional wisdom. Here we only have room to refer, very rapidly, to three of the most important ones.

The first conceptual advice stems from the idea of weakly efficient markets (Fama (1970)): in practical terms, market efficiency means that, on average, we (the average or representative investor) cannot systematically beat, i.e. outperform, the market. While this sounds like a blatant truism to educated economists it is generally not acknowledged amongst individual investors – with detrimental consequences for portfolio performance as a result of too much trading (Odean (1999), Barber and Odean (2000)). Investment magazines, TV shows, and even financial advisors emphasize (completely incentive compatible) individual investors' beliefs in active portfolio management on a daily basis – going straightly against the gist of what Finance would suggest for the less prodigious: namely, buy and hold.

Indeed, returns as generated by strategies of active portfolio-management deliver the strongest case for this point: on an annual basis, as has been amply shown (for example by Gruber (1996)), a clear majority of active portfolio managers do not manage to meet the benchmark. While there are, evidently, investors who do beat the average, some even over a substantial period of time, this does not contradict our general proposition. First of all, to tell the difference between above-average skill and

sheer luck on standard levels of confidence we would need (too) many data points. And those investors who apparently have the knack to do it consistently are, unfortunately, very rare birds indeed. This boils down to a corollary to a proposition (“do not try to beat the market”) already referred to, which is: “aim at mimicking a market index”. At the same time, this takes account of a of James Tobin’s very practical financial advice: “do not put all your eggs into one basket”.

The second mistake, conventionally made, and which has been long exposed by classical Finance, is the claim that stocks are not risky in the long-run (see for example Bodie (1991)). Unfortunately, reality flatly contradicts this point. While it is true, that the dispersion of stock returns decreases with the length of time, this does not allow us to conclude that the level of capital (claims on resources) we are striving to achieve through a savings plan will be attained. There remains a substantial shortfall risk. An indirect proof of this point is that in real world markets insurance premiums against asset price declines (the prices of put options, for example) do rise with time to maturity. What ultimately counts is not the geometric mean of changes (percentage returns) but the absolute (real) value of accumulated wealth. This is, of course, an absolute quantity which is targeted to be drawn upon in order to give command over real resources. And for this absolute level of assets to be attained, *actual* returns as well as their *time pattern* (as those of withdrawals) are decisive. Looking, instead, at the individual saver’s problem from the perspective of the geometric mean over a long period of time is simply misrepresenting the problem. Hence, age-dependent rules of thumb on the appropriate mix between stocks and bonds are wrong, see, e.g. Klos, Langer and Weber (2003) for an overview of this literature.

The whole issue becomes even more challenging if we account for the way of how individuals perceive long term risks. In a controlled experimental setting, Klos, Weber and Weber (2005) have shown that students (of economics) are rather mediocre in estimating risk (perceived risk as well as actual volatilities) in long term investment decisions. Here, our point is an a fortiori argument: When even highly trained students cannot cope with the problem the general public, almost by necessity, will be even less capable of doing so. To be sure, while acknowledging all these difficulties in long-term investment or capital allocation decisions, classical finance of course does not advocate staying away from stocks. But it emphasizes that one should be invested in equities in light of their contribution to one’s own targets, that is for the right reasons.

A third common misconception – the so-called over-confidence phenomenon – is more empirical than conceptual. This phenomenon subdivides into four biases: People tend to overestimate their own knowledge and abilities compared to others (better-than-average effect, see e.g. Svenson (1981)). Moreover, they tend to be too sure about their private information (mis-calibration, see e.g. Adams and Adams (1961)), intuitively even believing that they can control random events (illusion of control, see e.g. Langer (1975)). Finally, they are frequently irrationally optimistic about the future (over-optimism, see e.g. Weinstein (1980)).

This is not only an individual trait but, as Dimson et al. (2004) have shown, does exist on the corporate level as well: Numerous corporate pension plans do assume future return series which will be not achieved on average. All of this leads at the company as well as the individual level to under-funding – to a shortfall with regard to the amount of wealth strived for. With a bit of data handling – relying on survivorship bias and/or some sampling error – one can rather ingeniously construct apparently supportive evidence to the contrary. But, here again, knowing one's statistics is positively enlightening. A very instructive example of this line of applied 'Kantian' Finance has been given by Gary Burtless (2000) from the Brookings Institution. He has shown that the median replacement rate as an upshot of investing 6 percent of a workers income (plus all proceeds in between) over a 40 year period in the U.S. stock market (nota bene: this has been the best performing stock market, hence we do have a serious success bias) has been on average rather high, that is: 47 percent. But dispersion about this mean was substantial, that is the standard deviation was 22 percent and replacement rates ranged between about 20 and more than 100 percent of (peak real) earnings.⁵ What is important, the actual outcome was purely dependent on the timing, and it did vary substantially over only brief periods of time. Unfortunately, however, as mortals we cannot diversify away time risk. Coping with this risk is actually the major reason speaking in favor of an at least complementary role for generational contracts, implicit in pay-as-you-go systems.

While the biases referred to do appear in many facets of every-day life, behavioral finance, backed by empirical evidence, holds that over-confidence is one of the most important erroneous individual investor predis-

⁵ These results are gross of fees and they assume a fair annuitization of proceeds at the end of the investment period. In other words, they are positively biased.

positions. An upshot of this bias could be the (welfare decreasing) high trading volume in financial markets.⁶ Investors who think that they are better in e.g. analyzing fundamental information do trade their positions too intensively and, as a result of all this churning, reduce their portfolio returns substantially (see e.g. Glaser and Weber (2006)).

V. Perspectives – on Supporting Enlightened Investors

Modern finance comes in two guises: One is the physics part, starting from axioms with all the quantitative trappings – the part to which we referred in these remarks mainly. The other branch (behavioral finance) is inductive, acknowledging the behavior of real-world human beings and therefore applying insights from psychology. From this latter perspective we know that individual choices are heavily dependent on the context or the frame, i.e. how the information is presented (Tversky and Kahneman (1981)). Moreover, when individuals make choices they are frequently too much assured of themselves (see the last paragraph in section IV). At the same time and on average, we are hurt more by deceptions than we are pleased by positive surprises of equal magnitude: We do sport loss aversion (Kahneman and Tversky (1979)). Loss aversion as does over-confidence, however, lead to too much portfolio reshuffling, which translates into fees – and, as a rule, taxes returns substantially.

Behavioral finance has meanwhile produced a number of robust empirical results, being very much practical. In other words, they can be applied, as is shown in the second author's book *Genial einfach investieren*, to improve individuals' choices and decisions. A most important conclusion from behavioral finance research is that framing is decisive. Consequently, behavioral finance – somehow similar to the merit goods argument of classic public finance – suggests to nudge – light-handedly, as well as reversibly – individual behavior by introducing optimized default options. Those defaults would be in the individuals' best interest, of course. This is what 'libertarian paternalists' suggest (O'Donoghue and Rabin (2003), Thaler and Sunstein (2003)).

As an example, consider private pension plans. Since the average investor does not know much about optimal pension investing (e.g. how much to invest or the most favorable allocation between bonds and stocks) he tries to do "something normal". As a rule, normality is defined

⁶ In 2005, NYSE turnover equaled 103 percent of its market capitalization.

by the suppliers of those services – and here incentives are not necessarily closely aligned. Liberal paternalists (we prefer that wording, being less of an oxymoron), in view of the public goods component implied, therefore do see a case for some light-handed (that is, almost non-intrusive) standard setting. This is, of course, a very practical view – see, for example, in the U.S., the regulations on the 401k pension schemes or, in the German case, the Riester, Rürup schemes. That is, liberal paternalists would suggest a “normal” benchmark portfolio, optimizing a representative investor’s welfare. This is “liberal” because investors would not be compelled to follow such advice. Evidently, they could opt-out. At the same time it would be “paternalistic” by suggesting to investors an on average sensible positioning.

There are, quite evidently, counter-arguments. Admittedly, some of them do have to us a somewhat gratuitous ring. They remind us of the views, from a first-best world, against ‘merit goods’ (Musgrave and Musgrave (1989)). Unfortunately, this is in light of the on average available information set, information processing capacities and the self-control of real world individuals not the perspective we can start from. Therefore, in accounting for the real world lack of financial literacy, classical finance can deliver copiously. What is important: Finance, like enlightenment, can be about enabling not fear-mongering. It provides a toolbox to deal with “le commerce de promesses” (Pierre-Noel Giraud) with which investors are frequently confronted. But it also provides instruments and products to contain risks and enhance opportunities. Thus, most emphatically, finance can be deployed, in constructive ways indeed.

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Summary

Increasing Financial Literacy: A Public Policy Challenge

Individuals are supposed, by numerous reforms launched in particular over the last decade, to ever more provide on their own for their protection against potential mishaps or vulnerabilities. This holds true at least in a supplementary way, in

particular for the provision of old age insurance. At the same time, the required level of financial literacy, enabling consumers to face those tasks, however, appears to be lacking. And this is, rightly in our eyes, perceived as an important issue of policy. Our aim is to briefly show how finance, in its applied as well as in its behavioural dimension, can usefully contribute to this task.

Zusammenfassung

Stärkung der finanziellen Allgemeinbildung: Eine Herausforderung für die Politik

Die insbesondere während des vergangenen Jahrzehnts auf den Weg gebrachten Reformen unterstellen, dass private Haushalte immer stärker eigenständig Vorsorge gegen Unwägbarkeiten und Gefahren treffen. Das gilt mindestens in einem ergänzenden Sinne für die Altersvorsorge. Gleichzeitig fehlt allerdings häufig das finanzielle Verständnis, um derartigen Anforderungen zu entsprechen. Es wird deshalb zu Recht als eine wichtige öffentliche Aufgabe angesehen, die Voraussetzungen für finanzielle Allgemeinbildung zu schaffen. Das Ziel des Beitrags ist es, knapp zu zeigen, wie die moderne Finanzwissenschaft, sowohl in ihrer angewandten als auch ihrer verhaltenswissenschaftlichen Ausrichtung, auf nützliche Weise zu der Problemlösung beitragen kann.