

# **Conceptual Frameworks for Personal Finance**

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**Chris Robinson**  
Associate Professor of Finance

Schulich School of Business  
York University  
North York, Ontario M3J 1P3  
Canada  
Phone: 416-736-2100 x 77942  
E-Mail [findoctr@interlog.com](mailto:findoctr@interlog.com)

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# Conceptual Frameworks for Personal Finance

*This paper advances four conceptual frameworks for organizing research and teaching in personal finance from a neo-classical viewpoint: utility maximization; goal-directed planning; risk management; and the family life cycle. Research and teaching in personal finance display little integration or consistent underlying format. The teacher follows a standard list of topics and the researcher looks at isolated issues in topics like investments or insurance. Conceptual frameworks help us to understand how specific issues fit into a broader discipline or field of inquiry. The paper also discusses conceptual issues that do not seem to fit well within neo-classical economics, but are nonetheless very relevant to personal financial management as both a field of research inquiry and an applied professional occupation. The paper concludes with a proposed overall conceptual framework that embraces all of the separate frameworks.*

## INTRODUCTION

Open up any personal financial planning textbook, and you will see a standard list of subjects in the table of contents: time value of money, budgeting, income tax, insurance, buying a home, investments, retirement planning and estate planning. There are variations, but they matter very little. As Vihtelic (1996) shows, these standard topics are very similar to the topics in the introductory finance course in most programmes. The same is true of the syllabus or program of study for professional planning designations.

In this paper, I recommend that we start integrating our teaching and research in personal finance using some broader frameworks, at least at the level of neo-classical finance. None of the frameworks I suggest is unique or novel. They are inter-related and support each other, though in some points they also conflict. In both teaching and research, I would use all of the frameworks as ways of organizing and focusing our thinking, rather than any one of them as an exclusive way to view personal finance. Vihtelic (1996, pg. 124) emphasizes the importance of structure for any learning, whether it be finance or some other subject:

In addition to being intellectually exciting, learning is more likely to be remembered if it is tied together. Such emphasis on structure promotes transference of knowledge; good theory explains and is remembered. Further, the role of structure in learning takes on increased importance as today students have limited exposure to the materials they learn.<sup>1</sup>

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<sup>1</sup>Vihtelic in this quotation is concerned more with undergraduate education, but the need for structure applies to students at any age.

Chieffe and Rakes (1999) provide an encompassing framework for teaching personal financial planning that is based on a taxonomy of content in the standard format. They use a two by two division of the standard topics into planned and unplanned events, and current and future periods. All of the topics fall neatly into one of the four categories. I am proposing a scheme which is based more on neo-classical economic and finance theory, but the two schemes are related. For example, I propose risk management as one overall framework, and in the Chieffe and Rakes grouping, risk management is in the quadrant of unplanned current events.

The frameworks I suggest do not embrace everything that is important about personal finance as a discipline, and we already teach and investigate topics that are outside the simple concepts. The main reason for this is the relatively narrow world-view that neo-classical finance has forced itself into, following neo-classical economics. I refer to other issues outside these frameworks as well.

The four neo-classical frameworks are:

- classical utility maximization;
- goal-directed financial planning;
- risk management; and,
- family life cycle.

The remaining sections of the paper discuss each framework in turn to show how it helps us organize the field of personal finance and advance our understanding. I discuss alternative views, and then provide a more general conceptual framework that tries to embrace all of the ideas in the paper.

## **UTILITY MAXIMIZATION**

The oldest and most established of the frameworks derives from philosophy, but in its application in finance it is grounded in mathematical optimization. We develop some objective function that we wish to optimize on to give us the greatest satisfaction — say consumption of goods and services as defined by the money we have to buy them. This objective is constrained by various limits such as our budget (initial wealth, earnings, etc.). The solution provides guidance on how to maximize our utility (satisfaction) by manipulating variables under our control. The classic utility-based approach involves solving a dynamic stochastic optimization problem, with instantaneous utility of consumption, personal discount rates for consumption, utility of bequest, discount rates for bequest, stochastic time horizons, etc. See the work originated by Samuelson (1969), Merton (1993) and Richards (1975).

In our personal finance research and teaching we implicitly use this framework all the time. In research, it does appear more explicitly when searching for solutions to particular

allocation problems or trying to codify human behaviour. See, as an example, Schooley and Worden (1996), who investigate risk aversion empirically, using a set of consumer investment data. The utility maximization approach in its basic form — seek the alternative that gives the greatest satisfaction — is unarguably the fundamental basis of personal finance.

The problem with utility maximization lies in applying it to practical planning. Most individuals are not able to describe their utility-based risk preferences very clearly and hence cannot provide the financial planner with a well defined von-Neuman Morgenstern utility function to "plug into" a dynamic program. Furthermore, ground-breaking psychology studies, starting with Kahneman and Tversky (1979), have demonstrated that people do not behave according to the expected utility paradigm. This casts a shadow on the models' positive as well as normative abilities. Even if the recent work in what is called "behavioural finance" leads to a fuller understanding, we still won't have neat functional representations of personal finance decision-making. Accordingly, we need more practical frameworks as well, if we are to do more than provide inoperable theories.

## GOAL-DIRECTED PLANNING

Set up a formal goal with a time to meet it, and manipulate the variables in different

$$W_n = W_0(I + k)^n + \sum_{t=1}^n (E_t - C_t)(I + k)^{n-t}$$

scenarios to see what is needed to meet it:

where  $W$  is wealth,  $k$  is the rate of return,  $t$  is time,  $n$  is the number of periods until the goal,  $E$  is net earnings and  $C$  is consumption. We can interpret this equation to include almost everything we do in the various subject areas. The value of  $k$  is determined by how money is invested. The value of  $E$  comes from the human capital investment decision, and  $C$  is the consumption decision. The net of the two is the saving that can be used to accumulate toward some future goal,  $W_n$ . If  $E - C$  is negative in some years, then we are dealing with debt management. And so on.

This process is explicitly stated in this format in Ho and Robinson (2000) but it is the universal basis of both current teaching and financial planning practice. All the computer-based financial planning tools are simply spreadsheets that manipulate values of earnings, consumption and investment returns over a number of years to determine if specified goals (always stated as sums of money available at specified times) are feasible. For example, Crabb (1999) explicitly starts the learning process with a cash flow spreadsheet.

If instead of simply focusing on meeting the goal with fixed interest rates and fixed time lines, we allow these to be variable as well, then we can work in probabilistic personal finance, where the output is not a deterministic: "Yes, the goal is feasible/no, the goal is not feasible, with this plan." Instead, the output becomes a probability of meeting a goal, given a distribution of

the variables rather than a fixed estimate. The measure of risk under the utility-based method is taken as the standard deviation in the neo-classical literature, although this is not the only possible measure. In probabilistic personal finance, the risk measure is the probability of shortfall below a desired target, which is somewhat similar to semi-variance. Yuh et al. (1998) determine the retirement preparedness of families using this method, allowing the rate of return to be stochastic. Ho et al., (1994), Milevsky et al. (1997) and Milevsky and Robinson (2000) allow both the rate of return and the date of death to be stochastic to estimate the shortfall risk of different asset allocations and levels of consumption.

The advantage of goal-directed planning is its correspondence with the way most people think about their life. They have certain goals they want to reach: education, buy a house, buy a car, etc. They need to plan their finances to accomplish those goals, and failure to reach them results in lower utility. Thus, goal-directed planning is simply a practical way to process the information available in maximizing expected utility. The weakness of the deterministic planning is that it doesn't show the risk involved in different plans. Probabilistic planning adds a risk measure, but then creates a different, somewhat hidden problem. Any shortfall, small or large, is equally important, but that is not true in reality. In practical terms, a low shortfall probability will mean that substantial shortfalls are very unlikely if the assumed distributions of the variables are nicely-behaved, like the usual normal and lognormal patterns. Nonetheless, probabilistic planning still misses this important characteristic, and is properly viewed as a means of providing more detailed information about a proposed plan, rather than giving a precise recommendation.

## **FAMILY LIFE CYCLE**

Persons have limited lives, unlike companies. Modigliani and Brumberg (1954) develop a formal model of how a person changes financial position, earnings, consumption and savings throughout the life cycle. This model portrays where the average person might find him or herself at any age/stage in the life cycle. In aggregate, it will describe a population's financial situation.

However, this is not the only, nor even the most meaningful way to divide up the population. Marketers, following Wells and Gubar (1966), use the family life cycle because it is more useful in a practical sense. To give a simple example, a single male of 30 will purchase no diapers, but a married male of 30 with infant twins will purchase a great many diapers.

This distinction extends to personal finance. Ho and Robinson (2000, pg. 95) suggest eight categories, but of course others are possible:

- 1 Younger single
- 2 Younger couple, no children
- 3 Couple, dependent children

- 4 Single, dependent children
- 5 older couple, children independent, or nearly so
- 6 older single
- 7 couple, retired
- 8 single, retired.

This categorization is a useful guide to which issues are most likely important for which families. For example, budgeting is a big issue for stages 1–4, but less so in later stages. A single person with dependent children will have different financial planning issues than a couple with dependent children. Bernier and Robinson (1987) recommend using a life cycle approach as a strategic management tool for large financial institutions. Ho and Robinson (2000, pg. 95) suggest that the significance of the different elements of personal financial planning depend on the life cycle and it can be used as an initial diagnostic tool.

Empirical research using the life cycle model confirms that financial behaviour does conform to what we would expect. Davis and Carr (1992), Hanna et al. (1995) and Xiao (1996) examine various aggregate statistics of family budgeting, savings and asset ownership and find them strongly related to the life cycle stage.

The family life cycle is undoubtedly a valid portrayal of family financial behaviour in a general sense, and it makes an easy framework for someone new to finance because it is grounded in basic everyday behaviour. A planner diagnoses the most immediate or relevant needs of a family with it. It lacks precision, however, when we try to apply it in any more detail. A single 35 year old mother with two children and a job working in a laundry has different financial planning needs from an otherwise identical single mother who is a partner in a law firm. For that, we fall back on the richer frameworks of utility and goal-directed planning.

## **RISK MANAGEMENT**

Risk management can be as simple as the basic model of identify, evaluate, control, finance and monitor. It can also become a very complex topic in derivative securities, such as how to hedge a portfolio or how to evaluate a segregated mutual fund with a guarantee of 75% return of principal in 10 years. The links to the previous frameworks are obvious. For example, risk management changes as the family moves through the life cycle. Protecting human capital and the basic physical assets is the key issue in the earlier stages. In the later stages, protecting financial capital becomes more important as it constitutes an increasing share of the total family balance sheet. Minimizing shortfall risk, which is the implicit function of probabilistic goal-directed planning, is one form of risk management.

Risk management is an essential framework that is even more important to personal finance than in the investments and corporate finance fields where we see such an explosion of academic and professional research. Individuals and families are very different from

corporations. They have finite lives, and they are unable to diversify their human and physical capital in the way that investors in companies can. The magnitude of many risks facing families is much greater relative to their resources than the risks facing medium and large businesses.

In terms of teaching and practising financial planning, a risk management approach doesn't change any of the techniques, it changes the way you think about them. For example, budgeting is a basic skill that is particularly important in the earlier stages. To cast it in risk management terms, the risk at the early stages is failure to control consumption, which leads to excess debt. Further on, when children are getting closer to leaving home, the risk is that the family has not budgeted for post-secondary education. Then, during the peak savings years of the cycle, the risk is that the family will not properly estimate the amount needed for retirement, and will spend the surplus cash flow that arises when the home mortgage is paid and the children are independent. As is obvious, the risk management framework relates closely to the life cycle idea.

In research, risk management appears in the shortfall risk sense most often. It can be more precisely targeted at specific topics. For example, Brooks (1996) and Milevsky and Kim (1997) look at the risk aspects of investing in certificates of deposit and index-linked GICs, respectively.

A risk management framework can always bring more insight to personal finance teaching, research and practice. I don't think there is any disadvantage, but it cannot be used in isolation, either. As is evident in the preceding discussion, it relates to the other frameworks naturally, and the detailed aspects of planning need to be informed by more than just a consideration of risk.

## **OUTSIDE THE FRAMEWORKS**

Robinson and McGoun (1998) propose a broadening our perspective to look at the sociological differences that make personal finance different for different societies. We cannot speak of single normative rules that apply to everyone. We all know this is true, but our textbooks and research tend to ignore it. Recent research is starting to overcome this gap, but there is a long way to go. For example, Bajtelsmit et al. (1999) find that women are more risk averse in their allocation of assets in pension plans. Badu et al. (1999) and Gutter et al. (1999) find a variety of differences in risk aversion and decision-making between black and white families, using the Survey of Consumer Finances.

The issue of how to counsel a family or a person is also outside the neo-classical framework. In that framework, a family assesses its alternatives and chooses the utility-maximizing alternative. Everything is assumed to be well-defined. A topic of considerable importance for professional practitioners is how to make the horse drink after you have led it to water. You can provide the best advice for a family, but it means nothing if the family members don't follow it because they don't believe you, or can't understand you. Another consideration is

that you don't know if it the best advice if you have stuck too closely to a single neo-classical model in formulating it, without considering the personal and social context of the advice. To give a very simplistic example, you might prepare a financial plan that recommends a family invest entirely in equity to maximize the probability of reaching a stated retirement goal. Two generations ago members of the family lost their savings in the stock market crash of 1929. One generation ago they overcame the memory of this experience and invested in a variety of mining and oil ventures, which turned out to be shells created by dishonest promoters. Now this generation is so scarred by their memories of bad experiences, that a plain recommendation to go into equity will cause them to fire you as the adviser. How you educate them as to the proper way to invest in equity prudently is a counselling problem that no neo-classical economic model will resolve, if in fact it can be done at all.

## **INTEGRATING THE FRAMEWORKS**

Integration of such diverse ideas is never completely successful. The nature of personal finance research is to seek smaller, manageable problems for solution, and that process will avoid integrative frameworks that require consideration of many factors at once. Nonetheless, teachers and practitioners can use an integrated framework to guide their work, even though a single conceptual view should never become a straightjacket.

The most promising starting point is utility maximization, as I stated already. Creating the most satisfaction for a given set of resources is undeniably the objective of families. We can see that reflected in the various codes of conduct for professional planners, where the over-riding principle is always to work first in the interests of the client.

Individuals need ways to implement nice theories like utility maximization, and the mathematical direction taken by financial research is clearly ineffective. What individuals and families do is set goals that represent their belief of what will maximize their utility. Goal-directed planning, as it is practised and taught now, becomes the mechanism whereby planners help clients maximize utility.

Utility maximization is always subject to constraints. The mechanics of goal-directed planning incorporate constraints, and that is one of the ways we should teach budgeting, for example, as a quantification of resource constraints. Taxation is another set of constraints, investment returns history shows another set of constraints.

We can treat the risk management paradigm as yet another form of constraint, but not one that fits easily into the goal-directed paradigm. Using a shortfall risk approach will incorporate risk into a spreadsheet to some degree, but the large disaster possibilities like disability or premature death of a breadwinner probably need a separate analysis. You could then fit them back into the framework by making the required premiums part of the budget, and hence part of the set of resource constraints.

Finally, the non-traditional issues of sociology and counselling that I discussed briefly can also fit into this framework. They too form constraints on which solutions are possible, although the constraints are not of the usual economic form. These constraints have interesting properties, because they are both non-monetary and continuously evolving even if the monetary part of the plan does not change. As people grow and learn, they change their perspectives and so the social constraints may change. The reader should not mistake this statement as a suggestion that learning and growing always mean the person comes closer to accepting the neo-classical prescriptions. Personal growth could be the adoption of a different religion or philosophy that explicitly rejects part of the neo-classical framework. An obvious example is a family that adopts a religion or belief that material wealth is undesirable beyond basic physical needs. For them, maximization of consumption is not a relevant goal.

The one framework not integrated in this section is the family life cycle. It provides a valuable empirical basis for starting the planning process and understanding it. I would continue to use it for its educational value in this direction. However, it does not integrate well into any formal planning model because it ignores the essential fact that every family is different. When the planner or family starts the planning process, they identify their own specific goals, and their stage in the family life cycle is nothing more than one of the many facts that go into the plan.

## **CONCLUSION**

We should integrate our teaching, research and practice into some frameworks because of their usefulness in themselves, and because the introduction of structure makes learning and practice easier. I have proposed four neo-classical economic frameworks, each with some advantages and disadvantages. Although I recommend an integrated framework, we should not be bound into them alone. We still need to allow for diversity.

Neo-classical economics cannot capture everything worth knowing, and there are many issues that lie outside the boxes of these frameworks. We should also strive to incorporate more of these other views into our teaching, practice and research. A richer and more useful personal finance field can emerge if we keep our minds open.

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