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Résumé : Les économistes contemporains considèrent les taux d'intérêt observables comme étant la somme arithmétique de trois composantes qui peuvent être déterminées séparément, à savoir, d'un taux pur ou sans risque, d'une prime de risque et d'une prime d'inflation. Cette conception est déconnectée de l'analyse ordinaire des prix en termes de demande et d'offre. Comme alternative, nous présentons une approche réaliste pour l'étude de l'action humaine sous l'incertitude, basée sur le principe de la valeur subjective et sur la distinction entre probabilité de cas et probabilité de classe. Cette approche nous conduit à apprécier que, dans un marché libre, les risques des affaires ont tendance à être éliminés par les activités des entrepreneurs et, surtout, ne sauraient affecter l'escompte per se. Les différences observables entre les taux d'intérêt ne sont donc pas des compensations pour le risque. Elles résultent des appréciations subjectives des opportunités d'investissement.

Abstract: Present-day economists consider observable interest rates to be the arithmetic sum of a pure interest rate, a risk premium, and a price premium, each of which can be determined in separation from the others. This conception is problematic in that it is disconnected from ordinary demand-and-supply price theory. We present a realist approach to study human action under uncertainty, based on the principle of subjective value and on the Misesian distinction between case probability and class probability. This approach leads us to appreciate that, in a free-market setting, known business risks tend to be eliminated through entrepreneurial activity; and that case-probable risks by their very nature do not affect the discounting process per se. This implies that differences in observable interest rates cannot be explained as compensations for risk. They result from different subjective appreciations of available investment opportunities.

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The Myth of the Risk Premium

In economic analysis, the word "cost" is used in two very different meanings. On the one hand, it refers to the subjective value of the most important foregone choice alternative (opportunity cost). On the other hand, it is also used to designate the monetary value of the factors of production that are being consumed in a business venture (production costs). The present essay deals with costs in the latter sense, and with the risk element in the rate of interest in particular.

Most present-day economists consider observable interest rates to be the arithmetic sum of three main components, each of which is held to result from a distinct cause. One, there is a pure or real or risk-free interest rate component, which is typically believed to spring from time preference. Two, there is a risk premium that compensates the investor for market risks. Three, there is a price premium that compensates the investor for losses of the purchasing power of money. If we denominate the observable gross market rate with the letter **i**, the real or pure interest rate with the letter **r**, the risk premium with the letter **c** as in chance, and the price premium with **π**, then something like the following equation [1] is supposed to hold:

$$\mathbf{i = r + c + \pi} \qquad [1]$$

This equation can then be applied to calculate the risk-free interest rate; with variable **i** being derived from observation; variable **π** supposed to be equal to some calculated price-inflation rate; and variable **c** supposed to be equal to some calculated risk premium, typically a standard deviation around some average value. The equation can also be used to determine the value of risky assets by discounting their future cash flows, etc. Whatever the variant of this approach, such as the capital-asset pricing model, the basic idea is always the same: observable interest rates are held to be the arithmetic sum of different components, each of which can be determined in separation from the others.

The basic problem of this conception is that it is disconnected from ordinary demand-and-supply price theory. Human choice and human action either do not enter the picture at all, or they enter the picture under highly contrived assumptions, such as in the capital-asset pricing model.

In the present paper, we present an alternative realist approach for the study of risk, based on Ludwig von Mises' distinction between case probability and class probability. In the light of this realist approach it will appear that the prevailing conception of risk as related to the gross rate of interest is ill-founded. It is wrong to conceive of the gross interest rate as the sum of separate components. A closer analysis reveals that the whole idea of a risk premium within the gross rate of interest is a myth and should be discarded from economic science.

Our paper is organised as follows. In section 1 we present the distinction between case-probable and class-probable judgements. Section 2 contains a realist approach to the analysis of human action under uncertainty. In section 3 we apply this approach to study the impact of risk on the return on capital. In section 4, we discuss the significance of our findings for the theory of costs.

1. Case Probability and Class Probability

Frank Knight (1971 [1921], pp. 11 and 198f) revolutionised the economic analysis of uncertainty, profit, and loss by stressing the crucial difference between two types of uncertainty, namely, quantifiable uncertainty or risk; and unquantifiable uncertainty or simply uncertainty. Knight highlighted the crucial fact that risk strictly speaking entailed no uncertainty at all. It could be anticipated in advance. Entrepreneurs could protect themselves against it through suitable provisions in the balance sheets or by insurance contracts. Risk could therefore not be the origin of profits and losses. Only uncertainty could be the cause of profits and losses.

Ludwig von Mises later elaborated on this distinction by stripping it to its logical core. Most notably, Mises dissociated the analysis of probability (to which he dedicates an entire chapter of his treatise) from the analysis of risk (which he barely mentions). The theory of probability exclusively concerns *epistemic* questions (the truth of a judgement), while the analysis of risk also concerns *value* judgements (risk being an *undesired* possible consequence of action).

Mises (1949, p. 107) stressed that the Knightian categories of risk and uncertainty were rooted in two completely different types of probability, which shared only one basic characteristic: "A statement is probable if our knowledge concerning its content is deficient. We do not know everything which would be required for a definite decision between true and not

true. But, on the other hand, we do know something about it; we are in a position to say more than simply *non liquet* or *ignoramus*." Mises distinguished class probability from case probability. The application of the former was in the natural sciences, the application of the latter in the sciences of human action.

He defined (1949, p. 107) class probability as follows: "We know or assume to know, with regard to the problem concerned, everything about the behavior of a whole class of events or phenomena; but about the actual singular events or phenomena we know nothing but that they are elements of this class." The crucial feature of a class-probable judgement is that the person in question ignores the causal sequence that brings about a concrete event. For example, he ignores *why* this bottle brakes rather than another. He ignores *why* this barn burns rather than another. But he knows from experience that of all the bottles that are filled in that factory, 0.08% will brake on any given day; and that of all the barns on his county 0.03% will burn down each year. He knows that this concrete bottle is one of the bottles filled in that factory, and he knows that this barn stands in his county. Therefore, even though he is ignorant of the exact causes that will prompt this bottle to brake and this barn to burn, he can make a class-probable judgement on all bottles in that factory and on all barns in that county.

Knowledge and ignorance are combined quite differently when it comes to case-probable judgements. This is how Mises (1949, p. 110) defines case probability: "We know, with regard to a particular event, some of the factors which determine its outcome; but there are other determining factors about which we know nothing." And he adds right away: "Case probability has nothing in common with class probability but the incompleteness of our knowledge. In every other regard the two are entirely different." Indeed, the person who makes a case-probable judgement knows this and that exact causal sequence. For example, he knows that the revenue he will earn with his bakery depends on the number of other bakeries within walking distance. He knows that he can produce computer screens of the type X with technique A and also with technique B. He knows that that the tomato output of his farm will be at maximum with 250 sunny days and 80 days of rain. He knows the laws of mathematics, of physics, and of economics.

Knowledge in all these cases is exact and sometimes even universal. But it is deficient in two regards. On the one hand, it is incomplete. The person in question knows the influence that this and that factor will have on his revenue, on his physical output, etc. But there are other

factors that also might come into play and about which he knows nothing. On the other hand, when being confronted to the choices of other people, he is also ignorant of their future value judgements. That is, he ignores how several factors influencing these judgements will combine in the future.

Consider again the bakery example. Our would-be entrepreneur knows that the revenue of the bakery depends on a multitude of concrete causes, such as the number of other bakeries within walking distance, the number of families with children, the revenue of these families, the effort he puts into merchandising his croissants and breads, the unit prices at which he sells, etc. But he does not know exactly the relative impact of each of these factors on his income. That is, he does not know how much the customers will value a nice presentation and how much their decisions will depend on price. He might have some rough idea about the relative importance of each of these factors in the past. But he cannot extrapolate this knowledge into the future. He needs speculate or, in Mises' (1949, pp. 112f) words, he needs to bet on their relative influence in the future.

2. A Realist Approach to Human Action under Uncertainty

The conventional way to integrate risk into economic analysis is fatally flawed in the very way it conceives of the problem. The implicit assumption is that risk is something "out there" which can be studied by economists and other scholars, and which sooner or later will also be discovered by all other rational decision-makers. The risk-that-is-out-there can be included in the utility function of all economic agents and thereby determine demand and supply schedules.

However, this conception is untenable because risk (more generally speaking: probability) is an epistemic, not an ontic category. Probable judgements are relevant for economics only to the extent that they are selected by human choice and become manifest in human action.

Subjective value is the filter through which all probably true judgements, and therefore all assessments of risk, have to pass in order to become relevant for human action. And only the judgements that pass through that filter are therefore relevant for economics. Moreover, and most importantly, probable judgements that are considered to be important lead to action. Economic goods that are considered to be important for the realisation of one's projects are

being intentionally brought into existence (that is, produced), whereas all factors opposed to that realisation are eliminated as far as possible. Let us explain these considerations in a little bit more detail.

Subjective Value as a Filter of Relevance

Probability theory makes propositions about *human knowledge* about the world, not about the world as such or about human action in particular. The world as such and the transformation of the world as such are not probable. They are what they are, irrespective of how much human beings know about them. All things that happen in our world are completely determined. They are all subject to the inexorable laws of cause and effect. But human beings can only gain a very partial knowledge of these laws. It is our knowledge about the world that is more or less probable, not the world as such (see Poincaré 1912, p. 2; Fisher 1906, p. 266; Mises 1957, pp. 73f).

Moreover, probability theory as such has no *direct* relevance for economics. Human action is guided by judgements that are subjectively perceived to be probably true. But such judgements of truth are always mediated through value judgements. There is no direct connection between the (probable) truth of any proposition on the one hand, and human action on the other hand. Human beings always and everywhere need to weigh different (and often conflicting) judgements about future states of affairs in order to act.[1]

Economics deals with human action. It deals with the causes and consequences of decision-making in a context of scarcity. It does not concern itself with what the decision-makers *know* about themselves or the world around them. Economists take due account of the fact that the acting persons must have definite ideas about themselves and the world around them. They are not primarily interested in the truth of these ideas. They analyse the (intentional) consequences of true ideas no less than the (unintentional) consequences of wrong ones. But the first step of analysis always consists in adopting the point of view of the acting person. Risk, then, becomes relevant for economics to the extent that it relates to the value judgements of that person. The

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[1] This has been recognised early on by Bernoulli (1954 [1788], p. 24) who stressed that "no valid measurement of the value of a risk can be obtained without consideration being given to its *utility* […]."

realist way to analyse risk is from the point of view of subjective value, not from the point of view of any "objective" probabilities to be discovered out there.

The realist approach leads to us to stress two fundamental points that are at odds with the conventional approach. The first one is that not all things that are risky (that is, probable and undesirable) from *some* point of view (for example, from the point of view of a scholar) are also relevant from the point of view of the acting person. The second one is that the incompleteness of knowledge, which characterises all case-probable judgements, is not risky *per se* and does not necessarily have an impact on the valuation of actions and assets.

From a subjectivist point of view, there is very often no risk associated with the chosen course of action. This is particularly clear in the case of consumer choice. Most of the risks that an external observer might identify in human action simply disappear from the point of view of the protagonist. Smith thinks that drinking beer makes him happy. His mother, the external observer, disagrees. She thinks his beer drinking is risky. But for Smith this is irrelevant. He believes to know that drinking beer makes him happy. It is true that he "only" believes to know, but for economics this is all that counts. Smith's opinion might be wrong. But from an economic point of view this would be irrelevant because it would not influence the way Smith values beer relative to money.[2]

Similar considerations can be brought to bear on the problem of incomplete knowledge. The more Smith knows about the multifarious causal connections into which A and B are embedded, the better informed are his factual judgement value judgements. But more information does not necessarily *alter* his value judgement. He may know only one thing about an economic good and be perfectly happy with this very partial knowledge because, for him, it is the only relevant consideration. For example, in choosing a vacation hotel, Smith might only be interested in the distance between his hotel room and the beach. There is an unlimited number of other circumstances that would also influence his vacation experience. But *what he values* is only the distance between the bed and the beach. We might call him foolish, but if he is

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[2] The economic point of view also makes it irrelevant to consider the (psychological) phenomenon that certain beliefs are strongly held, whether others are not. For an economist, the strongly held beliefs are precisely those that a valued more than the others. It is not necessary to consider "strength of conviction" as a separate factor.

honest with himself, then there is no specific risk associated with his choice.[3]

Even if we admit that most consumer decisions are made with more circumspection, the fact remains that very often there is no significant (subjective) risk involved. Consumers' preferences very often depend on a relatively small number of characteristics of the goods that they consider to buy, and they are (believe to be) perfectly well informed about these characteristics. If they hesitate, it is not because of the risks associated with the factual assessment, but because of the risks associated with the value judgement they have to make.

The main risk of consumer choices pertains to durable goods. The risk is that one's future valuation will be different from the present valuation. Future valuations may be different because other factors than the ones that count now will become primordial. For example, in buying an apartment, a young family will not necessarily have a lot of appreciation for single-floor units, whereas a retired couple typically would. Future valuations may change as well because some of the known factors that count will deteriorate. For example, the subjective value of the apartment might sink when very obnoxious neighbours move into the other apartments, etc.

But consumers are typically aware of this problem. Precisely because future conditions might be different from present ones they have an incentive (a) to investigate as much as possible the factors that might influence future conditions including their own valuations; and (b) *to act strategically in the present*, in such a way as to eliminate as far as possible the influence of factors that are likely to have a negative impact, that is, the case-probable risks. Indeed, human action is the most important means through which the probability of desirable influences is increased, and the probability of undesirable influences diminished.[4]

The Production of Success

This strategical approach is likely to be even more pronounced in the case of producers. Brown is an entrepreneur fabricating headphones. The essential purpose of his activity is to gain his living, that is, to earn monetary revenue. He does this through the network of

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[3] This crucial consideration is prominent in some of the recent literature on "one-reason decision-making." See for example Katsikopoulos and Gigerenzer (2008).

[4] We owe this simple, but crucial insight to our good friend, Dr Georges Lane.

exchanges. He buys factors of production and sells headphones. For him the physical characteristics of the factors that he buys and of the headphones that he sells are only remotely connected to the immediate causes of his success, which are market prices, respectively the conditions of demand and supply.

In assessing market conditions, Brown is very much concerned with the problem of incomplete knowledge, much more so than Smith the consumer. Brown's success depends on the valuations of *other* people. Their valuations are driven by a great number of circumstances, which our producer does not and cannot completely know.

Moreover, for Brown the quality of his own knowledge is a crucial factor. Smith might believe that beer drinking makes him happy even if in fact it ruins his physical and mental health. Then beer drinking would be the right thing to do from his subjective point of view. Smith would be a "successful consumer." By contrast, for Brown, it would be fatal to use a production technique that impairs the quality of his products as perceived by the customers. He could not be successful by producing goods and services that are to his own liking. He must meet the demands of the customers. It follows that for entrepreneurs such as Brown there are very strong incentives to fill the voids of his incomplete knowledge of market conditions as far as possible, within the limits of reasonable cost.

Moreover, and crucially, entrepreneurs such as Brown do not so much produce material goods and services as they "produce success." They act strategically, in whatever way is necessary, within the limits of reasonable cost, to bring all factors into play that favour their success, and to eliminate or diminish the influence of all factors that prevent or endanger their success (the case-probable risks). They do this most notably by making suitable arrangements for the physical production of the goods and services from which they intend to derive revenue: hire the right executives, choose the right location, determine the appropriate amount of capital to be dedicated to this and that venture, etc. But they also try to stimulate all factors that are likely to increase their sales, and to eliminate or reduce the influence of other factors that hamper sales.

The bottom-line is that the very nature of entrepreneurial action is to eliminate the influence of case-probable risks and to bring into play the influence of desired factors. One might say that it tends to reduce the known (case-probable) risks and multiply the known factors of

success. However, as we have seen, the risks are not reduced in the sense of a reduction of the stochastic probability of their impact on the overall result; they are reduced in the sense that factors that have a known negative impact will be eliminated. For example, a tomato planter might reduce the risk of insufficient irrigation and insufficient temperature by moving his plantation indoors.

It is clear that not all risks can and will be eliminated. But the known negative influences will tend to be cut back to the extent that marginal cost is still covered by marginal expected revenue. And the presently unknown negative influences are researched as far as possible, within the same constraints of reasonable cost.

Let us also notice that there is no one-to-one relation between the incompleteness of knowledge and the value of the activity (or the asset) about which one is ignorant. One may know a lot about an asset, but these bits of information might all be negative pointers. And inversely, one might know just a few things about an asset, but these bits of information make it appear very desirable.

Finally, there is no way to value the unknown. Brown might be conscientious of the fact that, despite all his research and business intelligence, there might still be factors around that bear on the success of his endeavour and which he has not considered at all. But he could not evaluate these factors, precisely because he ignores them. His evaluations can only be based on the factors that he knows to have a positive or a negative impact on his project. He will then rely on the positive factors and try to contain the negative ones as far as possible. That is what production is all about. But he cannot evaluate what he does not know.

3. The Mirage of the Risk Premium

Let us now apply our realist approach to study the question of the risk premium within gross interest rates. Above we stated that the conventional approach is based on the idea that the observable interest rates are an arithmetic sum of different components, each of which can be determined in separation from the others.[5] As far as the component of the risk premium is

[5] "The spread between the interest rates on bonds with default risk and default-free bonds, both of

concerned, this approach involves three related challenges: (1) to define risk, (2) to measure that risk, and (3) to explain how that risk so measured relates to demand and supply schedules.

It is fair to say that there is today no general agreement on how these problems should best be solved.[6] In what follows, we will briefly discuss the most widespread approach, at the heart of which is the capital-asset pricing model, and then contrast it with the realist approach as outlined in the previous section.

The Risk Premium in Light of the Capital-Asset Pricing Model

The most widespread definition of risk conceives risk as the market risk of an asset, that is, as the standard deviation of its price (respectively as its return) around some average value. This conception goes back at least to Irving Fisher[7] and was developed in more detail after WWII by Markowitz (1952), Sharpe (1964), and others.

Sharpe argued that in general equilibrium, all portfolios and, in fact, all individual assets, will be perfectly correlated in such a way that there would prevail a linear relationship between their return on the one hand, and their market risk on the other hand. The equilibrium rate of return of each asset ($\mathbf{R_i}$) would be equal to the sum of a risk-free return ($\mathbf{R_{RF}}$) and a compensation for the market risk associated with that asset. Or, in the words of Howells and Bain (2000, p. 45), "the market will price risky assets in such a way that the return on a risky asset will be equal to the risk-free rate of return plus a fraction (or multiple) of the whole market risk premium." This idea is commonly expressed in equations of the sort of equation [2].

$$\mathbf{R_i = R_{RF} + \beta_i \cdot (\mu_M - R_{RF})} \qquad [2]$$

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the same maturity, called the risk premium, indicates how much additional interest people must earn to be willing to hold that risky bond." (Mishkin 2013, p. 161) This is also the usual way of presenting the risk premium among Austrian School economists. See Mises (1940, pp. 490-508; 1998 [1949], pp. 543-556) and Rothbard (1993 [1962], p. 497). The latter states "In the real world there is an additional *entrepreneurial (or "risk") component*, which *adds* to the interest rate in particularly risky ventures, and in accordance with the degree of risk." (emphasis in the original)

6 On the intricacies of defining "risk" see Rosa (1998) and Holton (2004).

7 In *The Nature of Capital and Income*, Fisher (1906, p. 279) distinguishes between three types of values: riskless, mathematical, and commercial. He proposes that to obtain the mathematical value of an interest rate, "we simply add to the riskless value the value of the chance of getting more, and subtract that of the chance of getting less." (1906, p. 282)

The capital-asset pricing model is ingenious because it explains and justifies the standard view, which holds that observable returns on capital are the sum of different components. It responds to all three challenges that we highlighted above. It defines risk, it measures risk, and it explains how risk influences the demand and supply of any asset. Indeed, each market participant would be ready to pay a price for any asset $\mathbf{A_i}$ such that its return $\mathbf{R_i}$ would correspond to equation [2]. And any current owner of $\mathbf{A_i}$ would require to be paid at least that amount.

However, the problems of this approach are numerous and well-known. Let us just mention two very important ones.

One, the definition of risk as market risk might be plausible for certain groups of investors, for example, for those with very short-term time horizons or for those who are heavily indebted. It is implausible for all others. Long-term investors are likely to consider market risk a boon rather than a bane.[8]

Two, the linear relationship between market risk and return (between the risk premium and the gross interest rate) is premised on the notion that the economy has reached general equilibrium and that all market participants share the same perception of returns and risks.

This assumption is highly problematic in that it implies a completely different risk structure than in any real-world market economy. Asset-price fluctuations would be much lower than in the real world, but liquidity risk might possibly be greater. People who agree in their assessments of risks and returns are much less likely to exchange any assets than those who disagree.

Moreover, and most importantly, if the explanation of risk premia concerns an equilibrium world, then at best it could "shed some light" on the risk premia as they exist in the real world, in which disequilibrium is permanent and ubiquitous. But what explains the rest? In other words, while the model does *not* explain how case-probable knowledge affects demand and supply schedules in the real world, there can be no doubt that the real world exists and that market participants buy and sell economic goods based on imperfect knowledge. What are, then, the real mechanisms that come here into play?

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[8] Also notice that the application of this conception of risk (as a standard deviation) puts the short-term oriented investor at a disadvantage vis-à-vis the long-term investor.

A Realist Perspective on the Return on Capital Assets

Let us start off with the familiar proposition that the return on a capital asset results from the subjective value differences between the asset, on the one hand, and the related future cash flows on the other hand. The present monetary value of a capital asset is so-to-say imputed backwards from the expected future cash flows. The present owner of the asset want to sell at some minimum price, which corresponds to a maximum expected return on the capital asset that they forego. Prospective buyers of the same asset want to buy it at some maximum price, which corresponds to a minimum expected return on the monetary capital that they invest. The resulting market price of the asset establishes the going return on capital, respectively the gross interest rate.

Now it is also well known that this mechanism of backward imputation is a general principle that applies to each single factor that contributes to the final product. This allows us to bring into play our above considerations about case probability and class probability.

The knowledge that there is a causal connection between a factor X and the product is case-probable knowledge. There is in the mind of the prospective buyer who invests in X no doubt about that causal connection.[9] In other words, there is no risk associated with acquiring X as far as this basic causal connection is concerned. There *is* a risk pertaining to the subjective evaluation of the monetary value of X's contribution – its marginal value product (MVP_X).[10] For example, the investor might overestimate it relative to another known contributing factors Y. In this case MVP_X would be too high and MVP_Y too low. The investor also runs a risk because he might ignore the influence of a factor Z, and in this case too his subjective evaluation of MVP_X would be too high.

However, these risks are irrelevant for the discounting of the MVP of X. Whatever the investor's subjective assessment of MVP_X, he will discount it by the same personal discount rate. If he estimates MVP_X to be relatively high, then the associated $DMVP_X$ will also be relatively high. If he judges MVP_X to be relatively low, then the same follows for $DMVP_X$. In short, whatever the

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[9] That is, unless he gambles, in which case he would by definition not invest, but gamble (see Mises 1949, pp. 112f).

[10] On the basic mechanisms of the determination of marginal value products (MVPs) and discounted marginal value products (DMVPs), see Rothbard (1993 [1962]), pp. 387-409.

case-probable risks that come into play, they do not *per se* affect the subject value difference between any factor of production and its contribution to the monetary value of the product. Whatever the case-probable risks the investor confronts, they do not show up in a risk premium within the discount rate that he uses to assess the present value of future cash flows.

Again, this is implied in the very nature of the type of risk that an investor confronts, which is case-probable risk. A risk premium, precisely because it would be included in the discount rate, would compensate him for risks *as far as the causal connection* between a factor X and the monetary value of the product of X is concerned. But in his subjective judgement this connection is not just probable, but known.

The bottom-line of the foregoing considerations is that differences in observable interest rates cannot be explained as compensations for risk. So how can they be explained? In what follows we shall argue that they do result from different subjective appreciations of available investment opportunities.

Different people value different causes differently. Some may think that the cause A will entail a rise in the market price of asset X, others might believe that A brings this about only in conjunction with B. Still others might consider that C is the relevant factor, etc. As a consequence, the demand schedule for X will be composed of a continuum of individual demands with very different motivations. If all popular causes are present, the demand will be at its maximum. If C is absent, the demand will be lower, and lower still if B, too, is not given.

Now, from a microeconomic point of view, this might create the impression that the price of X depends on a risk premium. If there are a lot of favourable circumstances, then the risk of owning X seems to be relatively low, and this goes in hand with a relatively high price. And inversely, if there are but a few such favourable circumstances, then the risk of owning X seems to be relatively high, and this goes in hand with a relatively low price. The difference in the two prices can then be interpreted as a "risk premium."

But this interpretation is unwarranted. It is not the case that all market participants evaluate the pros and cons of an asset X in the same way. It is not that case that they share the same view about which negative factors that could impact its yield, and how much they might affect its market price. Each of the persons who wishes to own X is motivated by different considerations. There is no agreement between the different contenders. What appears to be a

key factor of success in the eyes of one of them is irrelevant in the eyes of the other. They do not agree on the risks involved. Each of them evaluates X in the light of the circumstances that he himself, and maybe only himself, considers to be relevant. And each is willing to make a bid for X in the light of his personal assessment if and when the relevant circumstances are given.

No entrepreneur gambles with his capital.[11] Each entrepreneur, when he buys an asset, is convinced that this purchase will permit him to preserve and increase his capital. Otherwise he would simply not buy it. The reason why some are willing to bid a higher price, and others a lower for one and the same asset, is that they have different visions of what the relevant investment alternatives are. Suppose Mr Black is convinced he can make a 10 percent return on that capital by buying the asset X at the current market price. Then this conviction implies a maximum price he would be willing to pay for the alternative asset Y. Things would be very for someone with a different vision of his own investment opportunities.

The ordinary difference in price between a 2-year Bund and a 5-year Bund results from the fact that more people are willing to buy the former at relatively high prices. It does not result from any "discounting" of the 5-year Bund. There is in this respect not the least difference between assets that allegedly are subject to a risk premium and the economic goods that are not. Always and everywhere different goods attract different people who wish to own them at different prices, most notably because they see different alternatives.

But is it not true that some people discount the price they would otherwise be willing to pay by a risk component? Johnson would pay 100 dollars for a share of XY stock if it were free of risk. But because there are risks associated with it, he is only willing to bid 80 dollars. What is wrong with this representation of the investment process?

There is no way of knowing what the price of the share would be if it were risk-free. The share can only be bought as is. It is impossible to compare an actual market price to something that does not exist. Therefore, even though it were true that Johnson might fancy himself discounting the price with reference to some number that he himself has made up, or that somebody else has made up for him, this would be irrelevant for the economic analysis of what he does. From the economic point of view, there are only two relevant questions. The first one

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[11] Again, this is a tautological statement. Somebody who gambles with his savings is by definition not an entrepreneur, but a gambler.

is whether Smith is convinced that buying a XY share at this and that price will suit his ends, such as earn a profit, preserve his capital, control the company, etc. The second one concerns the available alternatives. If Johnson were not convinced to be successful, then he would be gambling with his capital, not investing it.

4. Risks as Costs

The idea that risks are part and parcel of business costs is fundamental for business accounting and reporting.

They may affect various business costs *indirectly*, through the risk component of the internal discount rate. The higher that risk component, the lower is the demand for factors of production, and thus cost expenditure.

Risk may affect business costs also *directly* through the income statement. Firms may create various provisions that enter the annual income statement as a business cost. For example, bad-debt provisions can be made for the probable default of its debtors and contingent-liability provisions for potential legal costs etc. All of these provisions enter the annual income statement as a business cost. Similarly, in setting up its balance sheet, a firm may estimate the monetary value of its fixed assets by discounting the associated cash flows, using an interest rate that may include various risk components. Changes of valuations resulting from changes in the risk component enter the income statement, too, under the rubric of "other comprehensive income" and thereby enter the income statement.[12]

From a microeconomic point of view, it is acceptable to think that risks are a "given" part of the firm's environment. However, economic analysis needs to overcome this narrow perspective and explain the ultimate causes of the realities that are given to the immediate experience of any single market participant. This is what Böhm-Bawerk achieved with respect

[12] Similarly, in French accounting practice, firms may establish provisions for risks and costs such as anticipated law suits (provision pour risques et charges) and provisions for doubtful claims (provisions pour créances douteuses), as well as provisions for exceptional use of fixed assets (provisions exceptionnelles). Firms may assess the value of their fixed assets as the present value of discounted expected future cash flows, based on the CAPM model. The standard procedure is to use a discount rate that results from the addition of three components: a riskless interest rate, a market-risk premium, and a premium for firm-specific risks (Ferdjallah-Cherel 2014, p. 60).

to the general theory of costs of production. He explained how factor prices ultimately result from the prices of their least important products. They were formed by discounting the prices of their products.[13]

As far as risk is concerned, we need to emphasise again that probabilities lead an epistemic existence, not an ontic one; and that risks are subjective elements of human action, not qualities of its objective environment.

Provisions for risk are a misnomer. In fact, such provisions are made *after* the investment. They are an *ex post* acknowledgment of an investment error. Errors are without any doubt costly, thus it is pertinent to account for them in the income statement as soon as the error is discovered. But errors are not "risky" at all. Risk is by its very nature a quality of *ex ante* judgements about the (imperfectly known) world, not an *ex post* reckoning of how the world is really like.

Similarly, as we have argued, the risk component in the gross interest rate is some sort of an optical illusion. Different prices for different assets result from the fact that buyers and sellers appreciate them subjectively. From a microeconomic perspective, the implied differences in yield might be called risk premia. And one might use such premia in computations with an internal interest rate, to distinguish more interesting ventures from less interesting ones. But this does not alter the fact that the idea of a risk premium is an intellectual short-cut. It does not correspond to any real object.

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[13] He thereby confirmed the Ricardian insight that the prices of factors were intimately tied up with the price of capital. Ricardo held that that factor revenues and capital revenues were caught up in a zero-sum game. The higher the return on capital, the lower must be the aggregate revenue of factors of production, and the other way round. Böhm-Bawerk nuanced this result by taking account of the time structure of production. In the light of his analysis, there was not necessarily an inverse relationship between the return on capital and aggregate factor income. For example, if, as a consequence of a decrease in the return on capital, the structure of production lengthens, and if the factors were now more than before employed in the higher stages of production (where their prices would be discounted more than in the lower stages) then aggregate factor incomes are likely to shrink even though the return on capital diminishes as well. See Böhm-Bawerk (1959 [1921], pp. 377f.

Conclusion

Despite the importance of risk in business accounting and in virtually all other areas of economic life, the economic analysis of risk is not in a satisfactory state. The reason is that economists have too light-heartedly adopted the analytical tools forged by mathematicians and statisticians.

Most present-day economists consider observable interest rates to be the arithmetic sum of a pure interest rate, a risk premium, and a price premium, each of which can be determined in separation from the others. We have argued that this conception is problematic in that it is disconnected from ordinary demand-and-supply analysis.

As a solution, we have presented an alternative realist approach for the study of risk, based on Ludwig von Mises' distinction between case probability and class probability and on the principle of subjective value. This approach led us to appreciate that, in a free-market setting, known risks that pertain to business tend to be eliminated through entrepreneurial activity. It also led us to the conclusion that the case-probable risks pertaining to the evaluation of any factor of production are not reflected in the discounting process *per se*, but rather in the assessment of that factor's marginal value product. The implication is that differences in observable interest rates cannot be explained as compensations for risk, but do result from different subjective appreciations of available investment opportunities.

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