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TERM PREMIUM PUZZLE: AN ALTERNATIVE EXPLANATION *

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Abstract. *For a long time the significant yield differential between extremely short-term and other short-term default-free government securities, i.e. short-end of yield curve slope has remained unexplained in the economic science. This phenomenon is known as 'term premium puzzle'. Prevailing theory based on consumption failed to explain many other empirically prooved market developments. We offer an explanation to solve the puzzle. The significance of those findings is far reaching than reviling the puzzle. Basic concept is already successfully used to explain many institutional developments, financial intermediary, for example, and can be also used to restate asset-pricing models and the theory of financial crises and disturbances.*

Key words: *yield curve, term premium, liquidity premium, uncertainty, the theory of bank.*

SHORTCOMINGS OF THE PREVAILING THEORY

Consumption based theory of asset pricing seems to say little about various stylised facts concerning the yield curve, such as its predominantly upward slope. This feature of yield curve is especially obvious in its short-end. It implies that short and long-term default risk-free debts are not perfectly substitutable. Time-persistent spread between treasury bills maturing for tree and six months, known as 'term premium puzzle', can be explained by means of merely neglected influence of time-horizon on predictability and, as a consequence, on market information efficiency as well. Shorter-time horizon or short-term asset implies more perfect possibilities to predict asset-pricing considerations. We will offer right this explanation for many observed puzzles in asset pricing. The equity premium puzzle and the risk-free rate puzzle originally identified by Mehra and Prescott (1985) we can consider as a proof of basic inadequacy of the main existing paradigm. As Weil (1989, p.416) stipulated '…if individual consumption is more risky than aggregate consumption, one can explain why the risk premium is large even though agents are only moderately risk-averse in the aggregate. At the same time, the price a consumer will be

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willing to pay for a safe unit of consumption tomorrow will rise – i.e., the risk-free rate will decrease. Therefore, the existence of heterogeneity and of *market imperfections* is likely to hold central stage in the explanation of the equity premium and risk-free rate puzzles. In the following we will focus on practically quite important and theoretically mostly disregarded influence of market imperfections steaming from information imperfections on asset pricing mechanism. More uncertainty included in information processing will command significant influence on asset pricing through forming of special kind of premium. This premium we'll call *uncertainty premium*, although we'll see there is no difference between this excess return and well-known liquidity premium.

BACK TO KNIGHT AND KEYNES

To be successful in discussing information impediments to market efficiency and market failure on mentioned way, it needs to start with basic contributions in the area. I feel free to address to the prominent scientific ancestors of theory of uncertainty influences. The first contribution to the extremely important distinction between insurable and noninsurable risk or real uncertainty is made by Frank Knight. According to Knight (1921, p.19-20.) "Uncertainty must be taken in a sense radically distinct from the familiar notion of risk, from which it has never been properly separated. The term 'risk', as loosely used in everyday speech and in economic discussion, really covers two things which, functionally at least, in their causal relations to the phenomena of economic organization, are categorically different… The essential fact is that 'risk' means in some cases a quantity susceptible of measurement, while at other times it is something distinctly not of this character; and there are far-reaching and crucial differences in the bearings of the phenomenon depending on which of the two is really present and operating. There are other ambiguities in the term 'risk' as well, which will be pointed out; but this is the most important. It will appear that a *measurable* uncertainty, or 'risk' proper, as we shall use the term, is so far different from an *unmeasurable* one that it is not in effect and uncertainty at all. We shall accordingly restrict the term 'uncertainty' to cases of the non-quantitive type".

These influencing ideas published many years ago, again are actualised recently. The above statement is almost the same as in Holmstrom and Tirol (1996, p. 187). They agree that 'given incomplete insurance, assets will command liquidity premia (even though all agents are risk-neutral). Such liquidity premia correspond to risk premia in standard asset-pricing models, but the empirical implications can be rather different', and in the same paper later, '… liquidity premium on the asset depend on what the asset delivers conditional on the productive sector experiencing a high liquidity shock… While a liquidity premium is a form of risk premium, its structure is different form that seen in standard asset-pricing models. In particular, how the asset behaves when liquidity is abundant is less relevant than how it behaves when liquidity is tight (p.189)'.

On the other side of theory, dealing with managerial decision-making, another confirmation was reached. Authors Mehrez et al (1984, p.19) have shown that even for a risk-neutral manager, replacing the uncertain cost by its mean would increase the profit. They have referred to this increase as the *uncertainty premium* and shown that it is equal to the expected value of perfect information. That is the single example of how we can find where explicitly distinct risk from uncertainty premium is in general framework. Authors

stress that one should not confuse the uncertainty premium with the conventional risk premium: the latter stems from subjective averseness to risk while the former reflects the objective costs imposed by imperfect knowledge. Thus, a manager who is not indifferent to risk may value the complete resolution of uncertainty more than the risk-neutral manager. This additional gain is related to his subjective attitude towards risk. For this reason, we will refer to the additional gain as the *risk premium*. It then follows that the total gain from the elimination of uncertainty is comprised of two parts: the objective premium plus the subjective risk premium. Quite the same approach one can find in Kane (1999. p.172). An investor seldom knows precisely what most securities are worth. They undertake information gathering and analysis to form estimates of this value. Estimation formation processes may differ, in that the same information may imply different values for different people. There may not be enough available information to assign a reliable probability measure on all security prices. Uncertainty exists about the identity of the major factors that will influence the future price of a given security. Uncertainty reduces to variance only in the case where the distribution is restricted to a particular form whose corresponding parameters are known. *Estimation-uncertainty premiums* should exist. Causal experience suggests that investors seldom bother to make themselves maximally informed. Because information gathering and processing is costly, investors should undertake information gathering and processing only as long as the marginal anticipated benefit exceeds the marginal anticipated cost of uncertainty reduction.

Amongst the great names in economic science Keynes is the one who we can consider a founder of subjective uncertainty theory. We daresay that we owe a great deal of Keynes misunderstanding and misrepresentation to Keynes's followers. Hicks, (1939, p. 163-164) refers to Keynes's view as follows from the quotation '…a part of the interest paid on actual securities is to be attributed to default risk; and a part of the interest paid, at least on long-term securities, is to be attributed to uncertainty of the future course of interest rates. Both of these elements are purely risk-elements; it these were the only elements in interest, it would be true to say that all interest is, in the end, nothing but a risk-premium. That is, I take it, the view of Mr. Keynes; his doctrine of 'Liquidity Preference' appears to reduce all interest into terms of these two risk factors. But to say that the rate of interest on perfectly safe securities is determined by nothing else but uncertainty of future interest rates seems to leave interest hanging by its own bootstraps; one feels an obstinate conviction that there must be more in it than that'.

Similar is true for Tobin's presentation of Keynes's opinion. He has offered a theory of risk-avoiding behaviour as a basis for liquidity preference. This theory does not depend on inelasticity of expectations of future interest rates, but can proceed from the assumption that the expected value of capital gain or loss from holding interest-bearing assets is always zero. Tobin (1958, p. 70) also made mistake when referring to Keynes's stance of view, because he neglects mention the position of Keynes. He stated 'when he (Keynes; added by author) refers to uncertainty in the market, he appears to mean disagreement among investors concerning the future of the rate rather than subjective doubt in the mind of an individual investor'. We, of course, disagree with this and offer proof in the following author's words.

Now, we'll quote a couple of crucial sentences derived from 'General Theory' which, we are of opinion, are the ones exclusively capable to express Keynes's stance of view (Keynes, 1973, p. 240-241) 'The liquidity-premium, it will be observed, is partly similar

to the risk-premium, but partly different; - the difference corresponding to the difference between the best estimates we can make of probabilities and the confidence with which we make them. When we were dealing, in earlier chapters, with the estimation of prospective yield, we did not enter into detail as to how the estimation is made: and to avoid complicating the argument, we did not distinguish differences in liquidity from differences in risk proper. It is evident, however, that in calculating the own-rate of interest we must allow for both. There is, clearly, no absolute standard of 'liquidity' but merely a scale of liquidity - a varying premium of which account has to be taken, in addition to the yield of use and the carrying-costs, in estimating the comparative attraction of what contributes to 'liquidity' is a partly vague one, changing form time to time and depending on social practices and institutions. The order of preference in the minds of owners of wealth in which at any given time they express their feelings about liquidity is, however, definite and is all we require for our analysis of the behaviour of the economic system.' Or 'the state of long-term expectation, upon which our decisions are based, does not solely depend, therefore, on the most probable forecast we can make. It also depends on the *confidence* with which we make this forecast - on how highly we rate the likelihood of our best forecast turning out quite wrong. If we expect large changes but are very uncertain as to what precise form these changes will take, then our confidence will be weak'. (Ibid, p.148). We have found some points referring to Keynes's liquidity preference and asset pricing modelling, in more recent published contribution of Woodward (1983, p. 356) matched with our point of view. Author admits that at least part of what Hicks and Keynes had in mind as a source of the liquidity premium was that the far future was inherently more uncertain than the near future, a proposition few of us would dispute.

FALLACY OF AMBIGUITIES: UNCERTAINTY, ASYMMETRIC INFORMATION AND LIQUIDITY?

This subtitle - contained question, we feel free to note, is not clearly answered, yet. Although, till today, in huge literatures dealing with the models build on dilution of 'omniscience' assumption, almost nothing is changed in traditional asset–pricing models. It is worth to mention important asymmetric information approach in financial intermediation theory, credit-rationing theory (Stiglitz and Weiss 1981), all of these started with Akerlof paper (1970).

Important results are reached in seminal Diamond and Dybvig paper (1983, p.405). By authors' words 'the model shows that asymmetric information lies at the root of liquidity demand'. While the authors were dealing with idiosyncratic shock on consumption, it is easy, inside the general framework, to show that sources for liquidity demand (if one considers financial intermediary) beside consumption uncertainty taken from depositors, are: uncertainty linked to interest rate risk (Hellwig 1994), default risk (Dutta and Kapur 1998), and (if one considers entrepreneur as a source of liquidity demand, or source of uncertainty) the risk of credit-rationing and the risk of profitability shock. (Holmstrom and Tirole, 2001).

What is uncertainty ? In previous section it is told enough about the definition of uncertainty we are willing to accept. What should be added is more about fuzzy boundary between uncertainty and risk in dynamic and institution- enriched framework. Once again we start with Knight (1921, p. 46) "The fact is that while a single situation involving a

known risk may be regarded as 'uncertain', this uncertainty is easily converted into effective certainty; for in a considerable number of such cases the results become predictable in accordance with the laws of chance, and the error in such prediction approaches zero as the number of cases is increased. Hence it is simply a matter of an elementary development of business organization to combine a sufficient number of cases to reduce the uncertainty to any desired limits. This is, of course, what is accomplished by the institution of insurance". However, it was agreed long ago (Samuelson 1963, p. 112-113) that no matter how large the number in the sample, in every actuarial situation of mathematical probability, we are left with a finite sample, so '…in the appropriate limit low of probability there will necessary be left an *epsilon* (italics mine) of uncertainty even in so-called risk situations … This virtual remark has great importance for the attempt to create a difference of kind between risk and uncertainty in the economics of investment and decision-making'. Otherwise, diversification and actuarial probabilities cannot reduce entirely the uncertainty effect, simply because finite number sample constrains that. **A**ccording to these well-known statements, we can consider liquidity insurance offered by banks (and by financial market, as well) as a means to decrease aggregate uncertainty. The intermediating role of banks is hardly distinctable from simple risk- taking activities, like in quality intermediating (credit risk and interest rate risk taking), but, it would be wrong to reduce bank's economy-wide role to one of these roles. Asset risk-profile transformation through information gathering and processing, monitoring (in any kinds of sense, included: screening projects *a priori*, preventing opportunistic behaviour and costly state verification) is just asset quality transformation role, but liquidity insurance or liquidity creation is essentially different role because it belongs to aggregate uncertainty reduction role.

What is liquidity, and finally, what are links with asymmetric information, or information imperfections and liquidity? Liquidity can be given many interpretations. According to Holmstrom and Tirole (1998, p.2) liquidity refers to the availability of instruments (market and nonmarket) that can be used to transfer wealth across periods. Myers and Rajan (1998, p. 733) used definition of liquidity as the ease with which it can be traded, in the sense the more liquid the assets, the greater their value in short-notice sales. These definitions are merely technical, and say nothing about deep inside quality of liquidity.

According to Diamond and Rajan (2000, p.2432) 'the source of illiquidity of the real asset (the project) and the financial asset (the loan to it) are the same: an agent's specific abilities, which lead to nonpledgeable rents. In the case of the project, it is the entrepreneur's greater ability to run it relative to a second best operator. In the case of the loan, it is the relationship lender's better ability to recover payments relative to someone who lends against it. Since an asset is illiquid because specialized human capital cannot easily be committed to it, devices that tie human capital to assets create liquidity.' A bank can serve as such a devise.

Focusing on information asymmetries within a trading context, Gorton and Pennacchi (1990) have developed asymmetric information - based notion of a security's 'liquidity'. A liquid security has the characteristic that it can be traded by uninformed agents, without loss to insiders. It is important to note, as first, that iliquidity is simply the consequence of information asymmetry, and as second, this asymmetry has specific cost approximated by mentioned loss to insiders, that is to say, a special kind of uncertainty or asymmetric information premium has to be paid by insiders, i.e. better informed agents to uninformed

ones. As a proof, theoretically of course, that there is a premium, Myers and Majluf model (1984) can serve. They show that, if a firm can issue default-free debt, then the firm does not have to pay the information asymmetry premium to outside investors. It simply means that risk premium and uncertainty premium are strictly linked. There is no uncertainty premium without responsive risk premium. But this answer is not complete, yet. How one can explain obvious differences in liquidity between two default-free securities, for example, between the short-term and the long-term government bonds? Logical step forward is to link the remaining kind of risks. That kind of risk is known as interest-rate risk, and its uncertainty counterpart is usually known as 'liquidity risk'.

THE MODEL

As we can see, there is a huge literature on those topics, especially related with theories of financial intermediation. But what is really rare is the attempt to incorporate liquidity or uncertainty considerations in more general financial market equilibrium models. Keynes in Chapter 17 of *General Theory* makes a pioneer attempt. He has simply employed the model of asset price equilibrium based on liquidity. The model is restated and used as a basis for well–known financial crisis hypothesis by Minsky (1982), and more explicitly in later Minsky's paper (1991, p.159-163). The model to be presented here is basically the model of Holmstrom and Tirole (2001), (hereafter HT) changed, mostly in respect of meanings of assumptions and variables. The approach is not quite new. Engle et al (1987) also identified uncertainty phenomenon as a reasonable explanation for time-varying risk premia in yield curve. As the degree of uncertainty in asset returns varies over time, the compensation required by risk averse economic agents for holding these assets, must also be varying' (p.391). The precision with which agents can predict the future varies significantly over time. In relatively quiet periods, like the mid-1960's, relatively accurate forecasts can be made and agents can speculate on the future without absorbing large risks. In volatile periods, like the early 1970's and early 1980's, forecasts are less certain and speculation is riskier. Risk premia therefore adjust to induce investors to absorb the greater uncertainty associated with holding the risky asset. (p. 405). This measure of uncertainty proved very significant in explaining the expected returns. They therefore conclude that risk premia are not time invariant; rather they vary systematically with agent's perceptions of underlying uncertainty (p. 406). Authors extended the simple ARCH technique to the model where the conditional variance is a determinant of the current risk premium. Mankiw and Summers (1984) also agree that only reasonable explanation for yield curve slope is liquidity premium. Term premium puzzle is good starting point to further research of liquidity-uncertainty phenomenon. Term premium should be expected to be a monotonically increasing function by time remain to maturity (or duration in case of coupon bonds). However, many empirical studies revealed time-varying premia. Short-end of yield curve is especially puzzled because it is much steeper and regularly with increasing slope. It gives well-known humped shape to yield curve.

The model to be presented derives liquidity preference from expected business firms' cash-flow shortage. There are no direct links between liquidity preference and uncertainty here. However, link is established through the influence of asymmetric information on credit rationing and firm's need for safe asset or source of liquidity, for example public

debt instruments. Liquidity demand is derived from marginal value of liquidity, which is state dependent on probability of aggregate liquidity shock. It is worth to note that this liquidity preference origin is model-specific. It is possible to give another explanation for it, a direct one. Namely, it is a simple uncertainty what one can derive liquidity demand from. Otherwise, when aggregate uncertainty became high enough, the natural response should be a drift from information-intensive assets to information-independent ones. Regarding that, it is possible to restate the well-known phrase 'flight-to-quality' in a new one, namely, 'flight-to-certainty'. It is wide observed that investors leave riskier assets in favour of less riskier ones. But, our opinion is that it is unimportant feature, because this kind of behaviour could equilibrate market in respect of observed changes of risk-return without any persistent and rapid disturbances. What the system makes prone to the crisis is propensity to be gone out of regular risk-return relations. That is, to charge itself by additional expected excess return, i.e. uncertainty premia.

In the model, corporate demand for financial asset is driven by the desire to hoard liquidity in order to fulfil future cash needs. In contrast with the logic of traditional asset pricing models based on perfect markets, corporations are unable to raise funds on the capital market up to the level of their expected income, and hence the corporate sector will need a cushion against liquidity shock (Holmstrom and Tirole (1996, 1998)). Financial asset that can serve as a cushion will command liquidity premia. In that sense, this model is 'market imperfections model' because it relies on influence of so called 'non-pledgeable part of future income', derived directly from asymmetric information feature of financial market.

Model starts with three periods (0,1 and 2), aggregate goods, and mass of identical entrepreneurs. They are risk - neutral, so they do not discount the future. Crucial assumption is done in respect of asset marketability. Future income is nonpledgeable, but it does not hold for bond holding. It is pledgeable entirely. Date-1 income x is assumed to be perfectly correlated across firms (it allows for aggregate liquidity shock), with $g(x)$ density and $G(x)$ cumulative distribution of x.

At date 1, the firm has the opportunity to invest an additional amount $y \geq 0$, which at date 2 generates a payoff $by - y^2/2$; $b > 1$. Reinvestments in the model must be financed using a combination of a firm's date-1 return x and its bond holdings (serves as a liquidity reserve) created at date-0.

Let $\bar{l}$ and $\overline{L}$ be supply of two kind of default-free zero-coupon bonds differing only in maturity, but no one of each let be long-term. For instance, let it be extremely short-term and longer short-term government bond, respectively. Assume that the first of them is yielding one unit of the goods at date 1, and the second yielding θ units of goods at date 2. As in Holmstrom and Tirole (2001) we start with θ defined as random variable with support $[0,\infty]$, density $h(\theta)$, cumulative distribution $H(\theta)$, and mean $E(\theta) = 1$. As it is obvious θ allows for a coupon risk of bond whose yield depends on this variable.

Additionally, we replace meanings of marks q and Q. In original HT model it was meaning date-0 prices of short- and long-term bonds, and according to this, short-term risk premium corresponds to $q > Q$. However, different meanings are given here in order to exclude the zero-coupon bond prices to be influenced by differences in maturity. Hence, those remaining prices (not yields), here denote prices adjusted to take care about the effect. The ordinary prices, it is obvious, must be related with systematic positive dif-

ference in favour of short-term zero-coupon bond regardless of any expected excess return, like price-risk or liquidity premium. So, $q > Q$, without the adjustment, as it was in HT, wouldn't necessarily denote existence of any kind of premium.

A contract between the entrepreneur (which has no money) and the investor (which should provide entrepreneur with amount equal to initial investment costs (I)) specifies the quantity $L + l$ of bonds purchased at date 0 and held by the firm as a liquid reserve, and the level $y(x)$ to be reinvested. The balance of liquid reserves at date 1, $x + L + l - y(x)$, is paid back to the investors.

An optimal contract can be determined by maximizing the entrepreneur's return:

$$\max_{\{y(.),\, l,\, L\}} E_0 \left[by(x) - \frac{(y(x))^2}{2} \right] \tag{1}$$

Subject to budget constraint:

$$E[x - I - y(x) - (q-1)l - (Q-1)L] \geq 0, \tag{2}$$

Since investors cannot commit to pay anything out of their date-1 income, the contract must satisfy the following liquidity constraints:

$$y(x) \leq x + l + \theta L\,. \tag{3}$$

Let μ denote the shadow cost of investors' break-even constraint and let $y^* = b - \mu$ denote the optimal unconstrained reinvestment level. Marginal value of the liquidity service is dependent on x, as follows:

$$m(x) \equiv \begin{cases} \dfrac{b - (x + \bar{l} + \theta\bar{L})}{\mu} - 1 & \text{for } x \leq y^* - \bar{l} - \theta\bar{L} \\ 0 & \text{for } x \geq y^* - \bar{l} - \theta\bar{L} \end{cases} \tag{4}$$

The equation means that some assets allow the firm to increase its reinvestment and related private benefit in liquidity-shortage states ($x < y^* - \bar{l} - \theta\bar{L}$). Thus, extra unit of liquidity allows the firm to increase reinvestment by one and the private benefit by $b - (x + \bar{l} + \theta\bar{L})$. This marginal benefit can be expressed in monetary terms dividing it by μ. The increase in reinvestment has a monetary cost that leads to the following equation of liquidity premium. Because bonds demand equalized supply amount in equilibrium, equilibrium prices are characterized by:

$$q - 1 = \int_0^{\infty} \left[\int_0^{y^* - \bar{l} - \theta\bar{L}} \left[\frac{b - (x + \bar{l} + \theta\bar{L})}{\mu} - 1 \right] g(x)dx \right] h(\theta)d\theta, \tag{5}$$

$$Q - 1 = \int_0^{\infty} \theta \left[\int_0^{y^* - \bar{l} - \theta\bar{L}} \left[\frac{b - (x + \bar{l} + \theta\bar{L})}{\mu} - 1 \right] g(x)dx \right] h(\theta)d\theta, \tag{6}$$

It is follows from equation (5) that liquidity premium, $q - 1 = E_0[m(x)]$, what means equal to *expected marginal value of the liquidity service* (represented by the innermost integrand in (5) and (6). Denote the inside integrals by $z(\theta)$, and because $z'(\theta) < 0$, hold:

$$Q - 1 = E[\theta z(\theta)] < E[\theta]E[z(\theta) = E[z(\theta)] = q - 1. \quad (7)$$

This equation serves in HT to show that price risk with assumed risk-neutral agents is irrelevant to asset pricing mechanism. What is influencing is presence of liquidity shortage causing longer-term bonds to sell at a discount relative to shorter-term ones. From expression (7) follow that marginal liquidity service or value of liquidity is negatively correlated with variation in the price of the long-term bond (θ). Thus, liquidity shortage (i.e. uncertainty) induced an endogenous degree of 'risk aversion' (Holmstrom and Tirole, 2001, p. 1859) and *premium*, as well.

CRITICS OF MODEL ROBUSTNESS

The liquidity premium is equal to the expected marginal value of the liquidity service. Without a shortage of liquidity, all bonds are perfect substitutes. Note that because of risk-neutrality assumption bonds are priced the same, irrespective of model-specific positive difference in price variability of long-term bonds relative to short-term ones. Note that 'in the liquidity approach, asset prices reflect a skewness in risk tolerance, which causes changes in the term structure as a function of changes in the likelihood of liquidity shortages' (Holmstrom and Tirol, p.1860). The last statement should be discussed. Robustness of the conclusions is significantly weak, because it depends on assumption treating (θ). As the first, (θ) was given the meaning of risk-variable. Myers and Majluf (1984) show that, if a firm can issue default-free debt, then the firm does not have to pay the relevant default-commanded information asymmetry premium to outside investors. It simply means that risk premium and uncertainty premium are strictly linked. There is no uncertainty premium without a responsive risk premium. Thus, only asset without certain return could command a liquidity premium. Otherwise, it is possible for short-term default-free debt instruments to carry more variable and therefore less predictable return. It is implied that increasing liquidity premium became an arbitrarily achieved result, conditioned on model assumption. For, the model has arbitrarily chosen assumption associating (θ) with longer-term bonds.

Moreover, obvious shortcoming of HT model is its inability to offer reasonable explanation for dominance of upward sloping yield curve. Expected time-distribution of aggregate liquidity shocks is offered as the explanation for shaping of yield curves. We disagree with this and offer a different approach. Namely, the shape and slope of yield curves are influenced by expected factors and uncertainty adjunct to the expectations. We can accept liquidity-shock explanation for persistent positive slope in short-end of yield curve, because of better predictability in shorter time-horizons. Similarly, liquidity preference origin could be reformulated, as well. Namely, in the case of liquidity squeeze the only way out from uncertainty premium increased costs on asset and liability side is to restructure asset side to items that are less information-intensified. That is to say, precaution impetus lies on the grounds of corporate liquidity demand.

The advantage of this model is its ability to express state-dependent nature of liquidity premium. Though we cannot agree with starting assumptions stressing business cash-flow nature of liquidity, the state-dependent nature seems as a reasonable explanation for empirically identified time-varying term premium.

We'll conclude the section with some observations that can serve as a special form of synthesis. It is important to take into consideration that decades ago Hicks (1939, p. 167) has stressed market frictions, i.e. transaction costs and information imperfections as the ingredients of interest rate, and drown link to crisis implications. Securities that are not generally acceptable in payment of debts bear some interest because they are imperfectly 'money'. Even if the possibility of default is ruled-out by the actual lenders, nevertheless costs and risks are involved when funds are held in the form of securities rather than money, for which the lenders require some compensation. 1) For a bill so short that the possibility of having to rediscount is ruled out, the only inferiority of the bill is the cost of investment; so the rate of interest on the bill corresponds to the cost of investment to the marginal lender. 2) For a bill of rather longer maturity than this, the possibility of having to rediscount the bill has also to be considered. The rate of interest on such a bill will have further to offset the risk of such rediscounting being necessary, to offer some compensation for the trouble which would be incurred in that eventuality. 3) For bills of still longer maturity, for long-term securities in general, and (sometimes) even for short bills, there has to be considered the additional risk that, if rediscounting becomes necessary, it will only be on unfavourable terms. But this additional risk, though it is always important for long-term securities, only becomes important for short-term securities as well, it the first risk (of having to rediscount at all) is already serious; thus it is essentially in conditions of great strain – more or less crisis conditions – that it may be expected to influence short rates of interest'. As one can observe, the third factor rests on the same intuition underlying liquidity preference in Holmstrom and Tirole (2001), and the first one is on grounds of intuition used by Shen and Starr (1998, p. 415-416). They conclude that theoretical grounds for bill yields to price the bills' own-price risk directly are weaker. Rather, it appears that own-price risk enters bid-ask spread and, hence, enters bill yields indirectly. Some of the term premium often attributed to risk premium is really a liquidity premium. The greater price risk of a 6-month T-bill versus a 3-month T-bill primarily concerns market makers. The market makers' risk exposure is reflected in the price of their services - the bid-ask spread. The bid-ask spread is a measure of (il)liquidity of the longer-term T-bills. Illiquidity (the bid-ask spread) is priced in the bills' expected excess returns – the term premium. In the regression analysis, authors confirmed that conditional standard deviation, a measure of own-price risk, was no longer significant when the bid-ask spread was included in the regression. They offer answers. Is liquidity priced in T-bill yields? Definitely. Is risk priced separately in T-bill yields? Possibly. Asset liquidity is an important attribute to investors. Liquidity is provided to the market at a price, the bid-ask spread. They conclude that liquidity differences are priced in T-bill yields, and account for an important part of the term premium. It is obvious that conflict between these tree approaches disappears when our unified approach is accepted featured with: 1) most variable part of aggregate return is liquidity premium; 2) this premium is derived from information-originated frictions; 3) these frictions can be asymmetric information (the term is usually used to cover agent-principal knowledge inequality), and other sorts of imperfect knowledge sources of uncertainty; 4) liquidity-uncertainty premium is increasing with maturity of instruments i.e. with the length of prediction horizons due to distribution of our knowledge that is biased to short prediction horizons.

AGENDA FOR FUTURE RESEARCH

The above survey explains importance of frictions presence and its influence on financial system functioning. Otherwise, we consider financial sector disturbances and financial crisis in general as a state of the abnormally generated frictions, like transaction costs, included bid-ask spread, banks' liquidity premium and other forms of uncertainty - dependent economic system levies. Important implications on financial crisis analysis are confirmed in many studies. Also, we founded a general financial crises prevention policy on the grounds of distinction between well-known risk premia and uncertainty premia, the approach we called 'two-tier premium concept'. The approach is employed in my PhD research and will be presented soon.

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NEDOUMICA ROČNE PREMIJE: MOGUĆE OBJAŠNJENJE

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Već izvesno vreme u ekonomskoj nauci ostaje neobjašnjena značajna razlika u prinosima na državne hartije od vrednosti u kratkom roku dospeća, tj. nagib krive prinosa na njenom samom početku. Ovaj fenomen je poznat kao "nedoumica ročne premije". Aktuelna teorija zasnovana na modelu potrošnje ne uspeva da objasni ni jedan broj ostalih empririjski dokazanih pojava na finansijskom tržištu. U ovom radu ponudićemo rešenje ove nedoumice. Značaj naših nalaza seže dalje od pomenute svrhe. Sam koncept se već uspećno koristi u objašnjenju mnogih pojava u oblasti razvoja institucija, na primer, finansijskih posrednika, a može se upotrebiti u reformulisanju modela ekvilibrijuma na finansijskom tržištu kao i teorije finansijskih kriza i ostalih poremećaja.

Ključne reči: *kriva prinosa, ročna premija, premija likvidnosti, neizvesnost, teorija banke.*