# SETTING THE MARKET PRICE

**Prof. Mario G.R. Pagliacci PhD.**
*Universita degli studi di Perugia*
**Prof. Ion Partachi PhD.**
*Academy of Economic Studies of Moldavia*
**Georgiana Niţu PhD. Student**
**Alexandru Badiu PhD. Student**
*Academy of Economic Studies, Bucharest*

**Abstract**

*This paper presents some consideration related to the modeling of the market price. There are treated the competitive markets for guarantees Arrow-Debreu, the theorem of economic welfare, the equity premium, the capital asset-pricing model, the theorem of second funds separation, the pricing of bonds. In this respect, the authors analyze the also the factors that influence the interest rate, and the yield curve. The investment in bonds offers a lower risk exposure for the investor, but the expected benefits are, likewise, smaller, which implies a precise measurement of invested resources and probable profits.*

**Key words:** *investment, bonds, market, price, wealth*

## Main elements regarding the competitive markets for guarantees Arrow-Debreu

Markets for risk sharing are introduced. There is an uncertainty on the state $\check{s}$ which will take place at the end of the period. We have n agents with risk aversion, $i = 1, ...., n$ and agent $i$ is endowed with a wealth addiction to $\omega_i(\check{s})$. $p(s)$ - represents the probability of s state, which means that someone has to pay $p(s)\pi(s)$ to obtain unity of consumer goods if and only if the state s happen.

Agent's decision problem is to find a guarantees portfolio Arrow-Debreu $c_i(\cdot)$ to maximize the utility of the EU's budget under restriction

$$\max_{c_i(\cdot)} Eu_i(c_i(\check{s})) \tag{1}$$

Budget restriction:

$$E\pi(\check{s})c_i(\check{s}) = E\pi(\check{s})\omega_i(\check{s}) \tag{2}$$

First order condition:

$$u_i'\big(c_i(s)\big) = \xi_i\pi(s) \tag{3}$$

For any s. From (2) and (3) we obtain function of demand $c_i = C_i(\pi)$.

To complete the model we add a condition to close the market

$$\sum_i^n c_i(s) = \sum_i^n \omega_i(s) = z(s) \tag{4}$$

for any s. The last condition shows, accumulated consumption in the state s may not exceed what is already available in this state. The main weakness of the model is the assumption that all individual risks can be traded in financial markets.

## The theorem of economic welfare

If we have two states $s$ and $s'$ with the same aggregate wealth, the competitive prices must be equal for any agent $i$, the agent $i$ will consume the same amount of goods in these two states.

Condition (3) can be rewrite : $\xi_i^{-1} u_i'\big(c_i(z)\big) = \pi(z)$. (5)

We conclude that competitive markets allocate macroeconomic risk in a Pareto efficient manner: by taking decisions decentralized and efficient distribution yields.

### The Equity Premium

In the first portfolio we normalize the price $E\pi(\check{z}) = 1$, which means that the risk free rate in this economy is 1 and for a representative agent utility function is normalized so that $Ev'(\check{z}) = 1$.

In the case of the second portfolio, because the individual wealth is subject to trading, this portfolio can be interpreted as a mutual fund diversified of economic assets. The price of this portfolio capital is equal to the price of all the assets it contains, with pay overdue of $E\alpha\check{z}$. Return on equity is calculated as follows:

$$\emptyset = \frac{E\check{z}}{E\check{z}\pi(\check{z})} - 1 = \frac{E\check{z}}{E\check{z}v'(\check{z})} - 1 \tag{6}$$

The difference between $\emptyset$ and the risk-free rate is called the equity premium.

### The Capital Asset-Pricing Model

We analyze price fixing for certain assets in this economy.

Individual risks that are not correlated with market risks are priced actuarial. Which is a direct consequence of the fact that risk aversion is a second order effect in the EU economic utility.

This shows that agents will fully ensure against risks diversified balance, which is compatible with Pareto efficiency.

### Theorem of second funds separation

In equilibrium, people choose co monotonic final value portfolios because they depend on achieving a single random variable $\check{z}$. But in special cases of linear risk tolerance, we know that the relationship $T_i(c)=t_i+\alpha c$ is linear. Linearity is an important consequence in a decentralized economy. It is sufficient to limit active offer to two funds. It would be a fund that offers a risk-free portfolio in net offer 0. In addition, it would be a completely diversified stock fund. It would be a fund whose purpose is to duplicate z performance on market, step by step. Allowing people to sell all their risks and the second fund and to buy shares from the two funds, it can be obtained a consumption plan that depends linearly on *z*. So, you can duplicate the balance allocated to these two funds.

This is the property of separating the two funds, which occurs in linear risk tolerance, also called the mutual fund theorem.

### Bond Pricing

Agent *i* is now endowed with a fix wealth $\omega_{i0}$ of consumer units at moment 0, $\omega_i(s)$ units at the next moment , for any *s*.

The relation $\omega_0 = \sum_i \omega_{i0}$ , expresses the accumulated wealth at the time 0.

Let us consider that the agent maximizes his reduced values of the economic flow utility EU over his life.

Agent *i* decision can be written under the form:

$$\max_{c_{i0}c_i(\cdot)} u_i(c_{i0}) + \beta E u_i(c_i(\check{s})),\ \beta \text{ discount factor}$$

with $c_{i0} + E\pi(\check{s})c_i(\check{s}) = \omega_{i0} + E\pi(\check{s})\omega_i(\check{s})$

Compensation market conditions are $\sum_i c_{i0} = \omega_0$.

$r = \frac{v'(z_0)}{\beta E v'(\tilde{z})} - 1 = \frac{v'(z_0)}{\beta E v'(z_0(1+\check{x}))} - 1,\ \check{x}$ represents growth rate of the economy. This formula allows us to determine the current market value for any asset whose future payment is known.

**Factors affecting interest rate**

To determine agents to accept a low current consumption so that to be compatible with current accumulated wealth, it needs a higher interest rate. The higher the growth rate g, the greater the balanced risk free rate. This is called the wealth effect. This explains why the rate tends to increase during economic booms and to go down during recession.

The aspect above occurs in the case when all individuals have a constant relative risk aversion $\gamma$. The price for a zero-coupon bond can be written:

$$B_1 = \frac{\beta E v'(z_0(1+\check{x}))}{v'(z_0)} = \beta E(1+\check{x})^{-\gamma}$$

**The Curve regarding the Yield**

The yield curve describes the relationship between interest rates and time horizon. Most often, the yield curve increases in the economy: a person has a higher profit when investing in long-term bonds than when investing in bonds with short maturity. In certain circumstances the yield curve can be inverted. Because the wealth effect and the effect of caution go in opposite directions, it is unclear if the interest rate increases or decreases with maturity asset. The yield curve is uniform. There will be no reward for investors on long term. This is where the effect of increased wealth and increased effect is outweighed caution.

**References**


- Anghelache, C., Anghel, M.G. (2015). *Statistică. Teorie, concepte, indicatori şi studii ce caz*, Editura Artifex, Bucureşti
- Anghelache, C., Anghel, M.G., Manole, A. (2015). *Modelare economică, financiar-bancară şi informatică*, Editura Artifex, Bucureşti
- Beissner, P., Riedel, F. (2014). *Non-Implementability of Arrow-Debreu Equilibria by Continuous Trading under Knightian Uncertainty*, arXiv.org in its series Papers with number 1409.6940.
- Brito, P., Dilão, R. (2010). *Equilibrium price dynamics in an overlapping-generations exchange economy*, Journal of Mathematical Economics, Volume (Year): 46 (2010), Issue (Month): 3 (May), pp. 343-355.
- Düppe, T., Weintraub, E.R. (2014). *Finding Equilibrium: Arrow, Debreu, McKenzie and the Problem of Scientific Credit*, Princeton University Press in Economics Books with number 10206.
- Minseong, K. (2016). *Futures market approach to understanding equity premium puzzle*, University Library of Munich, Germany in its series MPRA Paper with number 70310
- Radev, Y. (2012). *Complete Markets of Arrow and Debreu and the Dynamic Disequilibrium,* Economic Thought, Volume (Year): (2012), Issue (Month): 2, pp. 35-56, 57-75