Money flexibility, price elasticity, and elasticity of marginal utility of consumption

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Abstract

The development of G.Stigler's original model of search describes the mathematical relationship between the elasticity of the marginal utility of consumption, the price elasticity, and the elasticity of the marginal utility of money income with respect to increase in the price of living and/or to inflation. This relationship can be used not only in economics of well-being but also in microeconomics where the increase in the price of living, i.e., in purchase price, can make consumption "bad" under the Veblen effect.

Key words: money flexibility, price elasticity, elasticity of marginal utility of consumption, Veblen effect

JEL Classification: D11, D63.

Introduction

In 1959 R.Frisch described the method where price elasticities could be deducted from the knowledge of budget proportions and income elasticities with the help of the value of money flexibility. Later, that approach was successfully applied in the analysis of the national economy (Deaton 1974) as well as in the analysis of international comparisons (Bieri and de Janvry 1972). However, the development of the money flexibility approach discovered some problems with regard to its original presentation. First, price elasticities' estimates for want-independent goods resulted in diverse values of money flexibility (Scobie 1980). Second, sometimes the estimates of money flexibility were inconsistent with R.Frich's conclusion that the absolute value of money flexibility decreased with the increase in levels of real income (Pinstrup-Andersen et al. 1976).

In addition, researches quickly found the other vector of the analysis of money flexibility. The development of that concept enlightened the way to use the value of money flexibility as the indicator of well-being because its inverse value characterized "the relative distance of current income to the saturation expenditure level" (Bieri and de Janvry 1972, p.37). That idea corresponded to the general approach of the public economics where the concept of the marginal

utility of money income became very important (Layard et al. 2008). Hence, the original idea to measure price elasticites with the help of the concept of money flexibility was transformed into measurements of inequality by changes in the value of marginal utility of money income. However, as far as the economics of well-being was concerned, A.Atkinson's original approach to the measurement of inequality initiated the other vector of analysis, which resulted in the development of the concept of the elasticity of the marginal utility of consumption (Evans 2005, Buchholz and Schumacher 2010). This paper tries to discover the interconnection of the well-being vector of the concept of money flexibility with its original destination as the measure of price elasticity.

Money Flexibility vs. Price Elasticity and Elasticity of Marginal Utility of Consumption

In order to solve this methodological problem, we should come back to the origins of the concept of money flexibility when in 1932 R.Frisch published his "New Methods of Measuring Marginal Utility". There, we should pay attention not to the final flexibility equation but to one of intermediate equations, which accompanied the presentation of the concept of money flexibility. Frisch wrote, "the money flexibility can also be considered as the partial rate of change of the nominal money utility with respect to a change in the nominal income, the price of living being constant" (p.15). Then he introduced "the partial rate of change of the nominal money utility with respect to a change of the price of living" (p.15). In addition, Frisch presented those values in the following equation:

$$\varpi + \hat{w} = -1 \quad (1)$$

ϖ – the partial rate of change of the nominal money utility with respect to a change in the nominal income;
$\hat{w}$ – the partial rate of change of the nominal money utility with respect to a change of the price of living.

When R.Frisch presented the general flexibility equation, he paid attention to the problem of labor supply with respect to the new concept. However, he stopped there before "the more complicated case where the wage rate (affected) the living price" (Frisch 1932, p.113).

The analysis of consumer search can contribute to the resolution of this problem with the extension of the Equation (1). Indeed, the consumption-leisure utility function under search process corresponds to the assumption of separability as well as to Frisch's consideration of want-independent goods.

The development of G.Stigler's key equation with respect to the allocation of time under price dispersion provided the extension of the Equation (1) with the wage rate elasticity of price of

purchase, i.e., with the rate of change of purchase price with respect to a change in the wage rate (Malakhov 2013a)[1]:

$$e_{\lambda,P} + e_{\lambda,w} = e_{P,w} - 1 \quad (2.1)$$

λ – marginal utility of money;

$e_{\lambda,P}$ – price elasticity of the marginal utility of money;

$e_{\lambda,w}$ – wage rate elasticity of marginal utility of money;

$e_{P,w}$ – wage rate elastitity of purchase price.

The Equation (2.1) corresponds to the Equation (1) when the increase in the wage rate doesn't affect the purchase price, or $e_{P,w} = 0$:

$$e_{\lambda,P} + e_{\lambda,w} = -1 \quad (2.2)$$

When Frisch used the value of nominal income, he evidently came to the ambiguity of labor supply, which was well presented in the concluding part of his paper. The search model eliminates this ambiguity with the help of the value of the wage rate. And we can see that, when the change in the wage rate is followed by the corresponding change in prices, or $e_{P,w} = 1$, the Equation (2.1) equalizes price elasticity of the marginal utility of money with its wage rate elasticity:

$$e_{\lambda,P} + e_{\lambda,w} = 0 \quad (2.3)$$

Now we can rearrange the value of the price elasticity of the marginal utility of money with the help of the standard equation $\lambda = MU_Q/P$. Evidently, we get

$$e_{\lambda,P} = e_{MU_Q,P} - 1 \quad (3)$$

The combination of Equations (2.1) and (3) gives us

$$e_{MU_Q,P} + e_{\lambda,w} = e_{P,w} \quad (4)$$

However, the function $MU_Q(P)$ is not so simple. The function $MU_Q(P) = MU_Q(Q(P))$ seems to be more appropriate for the analysis of the marginal utility of consumption. If this consideration is true, it is easy to show that:

$$e_{MU_Q,P} = e_{MU_Q,Q} \times e_{Q,P} \quad (5)$$

And the new combination, here of the Equation (4) with the Equation (3) gives us the final result

$$e_{MU_Q,P} + e_{\lambda,w} = e_{P,w} = e_{MU_Q,Q} e_{Q,P} + e_{\lambda,w} \quad (6)$$

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[1] The original equation of the search model takes as the argument the absolute value of the marginal savings on purchase, or $|\partial P/\partial S|$, where P is the price of purchase and S is the time of search. The assumption that marginal savings are unit elastic with respect to price level, i.e., $e_{|\partial P/\partial S|,P} = 1$, gives us the Equation (2.1).

The Equation (6) gives us very informative particular case when the increase in wage rate doesn't affect the price of living, or $e_{P,w}=0$:

$$e_{MU_Q \cdot Q} e_{Q,P} + e_{\lambda,w} = 0 \quad (7.1)$$

The Equation (7.1) might be useful in the economics of well-being, where the elasticity of the marginal utility of consumption, or η value, is used as an ethical parameter of inequality. And the Equation (7.1) can be rewritten in the following general form:

$$\eta e_{Q,P} + e_{\lambda,w} = e_{P,w} \quad (7.2)$$

The measurement of the η value represents the same problem as the measurement of the value of money flexibility. In both cases the dispersion of estimates is very important. Usually the η value is taken in the range between 1 and 4. Weitzman (2007) considered the value $\eta =1$ to be "the lowest lower bound of just about any economist's best guess range." (Weitzman 2007, p.707). However, there were many empirical studies of the η value, based on surveys and experiments, where absolute values of inequality aversion of respondents lied below 1 (Amiel et al. (1999), Pirttila and Uusitalo (2007). Indeed, empirical studies of the size of η value are based on questionnaires and it seems to be difficult to separate general ethical estimates from individual preferences, and, therefore, individual utilities. So, the dispersion of estimates looks inevitable.

The problem of low η values is the problem of implausibly high savings rates in models of economic growth. On the other hand, as the Equation (7.2) demonstrates, people can substitute savings by the quality, i.e., by longer commodities' lifecycles, in current consumption. Really, for the given $e_{\lambda,w}$ value the increase in purchase price $e_{P,w}$ results in the increase in the $\eta e_{Q,P}$ value.

However, the increase in purchase price could happen involuntarily. The Equation (7.2) can also be considered as the solution for the relationship between the marginal utility of money income and inflation rate for the given consumption pattern $\eta e_{Q,P}$, if we agree to derive the inflation rate from the wage rate elasticity of prices $e_{P,w}$.

Positive Money Flexibility

The consideration of the increase in quality of an item to be purchased immediately raises the question whether the rates of change of both $\eta e_{Q,P}$ value and $e_{P,w}$ value are equal, i.e., whether the value of wage rate elasticity of the marginal utility of money $e_{\lambda,w}$ stays constant? There are following simple economic considerations: quality, commodities' lifecycle, and the purchase price are not continuous functions of the wage rate, and the elasticity of the marginal utility of consumption tends to a constant value, which enlighten different rates of change of $\eta e_{Q,P}$ value and $e_{P,w}$ value. Moreover, even a proportional change in price elasticity with respect to the

change in purchase price cannot keep the wage rate elasticity of the marginal utility of money $e_{\lambda,w}$ constant. These simple considerations show that ***if the rate of change of the $\eta e_{Q,P}$ value is less than the rate of change in the $e_{P,w}$ valu**e, **the increase in purchase price decreases the absolute value of money flexibility $e_{\lambda,w}$.***

This consideration seems not to be a problem for the Frisch's middle-income bracket, i.e., "the median part of the population", characterized by rather important value of money flexibility ($\varpi = -2$). But for the better-off part of the population ($\varpi = -0.7$) this consideration could represent a serious problem. Really, for the values $-1 < e_{\lambda,w} < 0$ there is a risk that once increase in purchase price could result in the positive $e_{\lambda,w}$ value. In addition, low η values can dramatically increase this risk because even a modest increase in purchase price can result in the positive $e_{\lambda,w}$ value.

If the increase in purchase price represents a continuous function, then the better-off part of the population could meet a mathematical catastrophe. However, in reality the increase in purchase price is not continuous and consumers miss points of mathematical catastrophes. But they can encounter an economic catastrophe. Moreover, it would be a chain of economic catastrophes.

The positive $e_{\lambda,w}$ value happens, when the marginal utility of money λ becomes negative. Thus, the marginal utility of an item to be purchased also becomes negative. Then, the elasticity of the marginal utility of consumption η becomes positive. And the $\eta e_{Q,P}$ value can keep its positive sign only if the price elasticity becomes positive, or $\partial Q/\partial P > 0$, and the Veblen effect takes place.

Of course, if a graduate gets a professional job after a couple of years in McDonald's during his studies, the purchase of a brand suit can be considered as a risky investment. In this case the value of money flexibility becomes positive due to the positive $\partial \lambda/\partial w$ derivative. However, this is rather difficult to consider all luxury purchases to be risky investments.

When the search process separates utility functions and commodities behave as want-independent goods, in some cases the marginal utility of money can become negative. The process of optimization of the consumption-leisure utility function looses its sense because consumption becomes "bad" and it can be "depreciated" only by an important increase in leisure time (Malakhov 2013a).

Conclusion

If we apply these theoretical considerations to everyday economic behavior we can see that there are simple commonsense cognitive mechanisms that can prevent consumption to become "bad". The same mechanism underlies the satisficing decision in the search process. There, the simple reasoning "that's enough to search" is followed by the mathematical description of the decision-making, that equalizes marginal values of search and optimizes the underlying consumption-leisure utility function (Malakhov 2012,2013b). The decision to increase the purchase price can

face the counter-Veblen effect when individuals try to avoid ostentation (Lea et al. 1987). Indeed, sometimes social norms can inherit medieval sumptuary laws. Here, the commonsense decision "that's enough to search" takes the form of the reasoning "that's too expensive". However, social norms are not so restrictive and Frisch's money flexibility stratification of "still poor part of the population with a fairly pronounced desire to become better off" (Frisch 1959, p.189) can get another sense in the form of the Veblen effect.

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