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The Profit-Based Approach
Αποτίμηση Κεφαλαιακών Τίτλων από τα Θεμελιώδη Μεγέθη: Η Προσέγγιση των Κερδών

Νικόλαος Κ. Στραβελάκης

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3f. Expectations and Financial Arbitrage – The Reflexivity Theory of George Soros

The analysis conducted so far indicates that both interest rates and yield spreads are expected to exhibit high volatility in the context of the profit-based approach. The main underlying reason is that the regulating rate of profit and the average industrial rate of profit are not the same. This is a particularity of the profit-based approach coming directly from the classical theory of competition and its application by Marx. In neoclassical and neo-Ricardian economics, the price of capital adjusts, and all capitals earn the average rate of profit. As we saw in section 3.1 this is not the case in classical political economy and Marx where we anticipate that only the rate of return of the regulating capitals tends to become equalized. The latter is different from the average rate because new products and techniques are persistently applied. But there is more in this because equalization of returns is reached through the mobility of capital, it is the rate of return on new investments (the incremental rate of profit) that plays the crucial part in this process. We will see shortly that this measure also approximates the definition of the regulating rate of profit of equation 3.3, 3.3'. This means that the incremental rate of profit is expected to be persistently different from the average industrial rate, and indeed it is.

As indicated by equation 3.23, the difference between the average and the regulating rate of profit induces strong variability in interest rates. The latter passes to yield spreads as indicated in equation 3.34, and as we will see shortly is also reflected on the returns of stocks and bonds. All this even though throughout our analysis I have assumed that returns between the industrial and the financial sector are equalized.

But things do not stop there, from equations 3.3, 3.3' we saw that bank reserves R_t enter in the determination of the regulating rate of profit r_1. This means that changes in monetary policy and expectations may alter the profit rate (the fundamentals) around which this equalization takes place. In this world, it is unreasonable to consider equilibrium as a point of rest. On the contrary, it points at a turbulent process where actual rates of return and consequently market interest rates will deviate from the fundamental values also altering the fundamentals themselves.

Nevertheless, equations 3.3, 3.23, and 3.34 pose a limit to the extent and the duration of such disequilibrium dynamics. For example, positive expectations about the future will reduce or keep constant the amount of reserves R_t. This will increase the regulating rate of profit r_1 more than the rate of interest on

loans[1]. This will bring an increase in the 'rate of profit of enterprise' that will boost growth and expectations further leading to a speculative rally around bonds or interest rate spreads.

Up to this point expectations represent a self-validating process. Bankers believe that the economy is going to do better they keep lower reserves, and the economy does better because of their initial expectations. However, at some point, the regulating rate of profit will tend to approach the average rate of profit (equation 3.23). At that point, expectations cannot boost the rate of profit further and the rate of interest will now depend on the leverage ratio $\frac{L_t}{K_{t-1}}$ (equation 3.24). If the average industrial rate of profit is sufficiently high, then a simple correction will happen interest rates will increase debt will be tempered and the rate of growth will fall towards sustainable levels. But if the average rate of profit is below a certain limit (inequality 3.29) then interest rates surge the rate of profit of enterprise will turn zero and stagnation prevails. In short, fundamentals have relative autonomy and for this reason, expectations cannot be self-fulfilling. In other words, there are inherent limits to speculative rallies.

Surprisingly, an expectation theory that encompasses these properties was not introduced by Marxist or heterodox economists, but by the investor and speculator George Soros (1994, 2009, 2013). Anwar Shaikh (2010, 2014, 2016) brought this theory to our attention and developed it further. He points out that Soros' theory suggests that: '1) expectations affect actual prices, 2) actual prices can affect fundamentals and 3) expectations are in turn influenced by the behavior of actual prices and fundamental prices' (Shaikh 2016: 446). It is a theory that incorporates all aspects of the example of the previous paragraph.

The obvious question is 'what are the underlying behavioral patterns?' Or in Soros' own words his 'decision-making process' (Soros 1994). The starting point of the theory is that financial markets cannot discount the future correctly because they 'shape it'. Decisions are made by both a passive relationship with reality (cognitive function) and an active relation (participating function). The interaction between these two functions is called 'reflexivity'. This word gave the name to the theory (reflexivity theory). The idea is that reflexivity is an unending process where reality shapes people's thinking and people, in turn, shape reality. Although people's perceptions and reality can come close, they never become identical. The reason is what Soros calls 'participants bias'. Participant bias gives an element of indeterminacy mainly because market

[1] Keep in mind that the latter depends also on the ratio of reserves to loans $\frac{R_t}{L_t}$ (equation 3.23) that is expected to decline.

participants do not share identical views regarding economic facts and conditions. This makes the whole process unpredictable. In other words, although the random walk hypothesis does not apply to this model, the knowledge gained from it cannot make people rich by predicting future prices. Nevertheless, judging from the personal finances of George Soros, it can be useful.

The critical factor of the theory is that 'participant's bias' can change the fundamentals which determine asset prices as indicated in our example. In a different fashion from the example outlined above, where the regulating profit rate r_1 is inflated from the relatively small amount of reserves held by banks, Soros (1994) presents the case of 'equity leveraging'. In short, equity leveraging refers to a situation where corporations use inflated expectations about future earnings per share to issue new overpriced stocks. The overpriced stocks in turn validate the expectations of increasing earnings per share for some time if they are used, for example, to reduce corporate debt2. This way participants' bias makes expectations a self-validating process. All the examples discussed so far indicate that fundamentals can be influenced by expectations either through a fallacy like in the case of 'equity leveraging' or by banks seeking to increase their profits by expanding their balance sheet. In other words, 'personal bias' can take many forms.

Reasonably, the self-validating capacity gives rise to a speculative boom that pushes prices away from fundamental values even if increased prices can keep altering fundamentals for some time. In other words, fundamentals cannot follow expectations forever and this way booms are followed by busts.

On these grounds, Soros indicates another important matter about reflexivity. He suggests that reflexivity is not another way of looking at things, but a different way events unfold. If reflexivity theory holds, then the efficient market hypothesis where prices can deviate from equilibrium values only randomly is invalidated. Here deviations are path-dependent both in the boom but also in the bust. The key to this outcome is the effect of expectations on fundamentals which leads to path-dependent asset prices. This point is expressly rejected by rational expectations theory where expectations cannot affect equilibrium prices and therefore actual prices are not path-dependent. For reflexivity theory, the time path of asset prices is non-ergodic contrary to the assumptions

[2] A simple example. A company has a debt of 100 currency units for which it pays an interest of 10 units. It has 10 common stocks issued and a net profit of 5 units. Therefore, its current earnings per share is 0.5 currency units (5/10). If all other factors remain the same with the difference that the company pays out its debt from the proceeds of the of issue of share capital, then it has a net profit of 15 units (assuming there are no income taxes involved) and the earnings per share will be 0.75 units (15/20). Therefore, the share capital increase with the expectation of higher earnings per share validates itself.

of intertemporal equilibrium models that underlie mainstream asset pricing (Davidson 1991, see also chapter 2 sections 2e and 2f).

It is important to note that the behavioral patterns described in this section require the mobilization of considerable funds. The control over the fundamentals during the period of the speculative boom but also the correction or the bust that follows it requires the investment and withdrawal of big amounts of funds. This justifies the statement of the profit-based approach that financial capital controls financial asset returns. Finally, the 'participants' bias', understood as the difference of opinion between market participants indicates that arbitrage is a permanent but risky element of the financial markets. This is the notion of turbulent arbitrage (Shaikh 1997) briefly outlined together with these points in the first two chapters.

Based on this framework I will move on to price stocks and bonds. But before this, it is worth fully clarifying the relation of reflexivity theory to the classical and neoclassical notions of equilibrium (Mueller 1986: 8). This is an important point since Soros throughout his writings understands equilibrium only in the neoclassical sense of the point of rest. The latter explains why he considers the conditions in the financial markets as a permanent disequilibrium. The formulation of Soros' ideas by Shaikh (2010) will prove helpful in this regard.

Shaikh (2010) has shown that for any asset the interaction between actual prices, expected prices, and fundamental prices can result in the gravitation of actual prices around the time path of fundamental prices. In this regard, he presented the following dynamic model which I modified for the interest rate although it applies to any financial asset price.

$$3.37 \quad \frac{di}{dt} = \delta \cdot (i^e - i), \qquad \delta > 0$$

$$3.38 \quad \frac{di^*}{dt} = \beta \cdot (i - i^*), \qquad \beta > 0$$

$$3.39 \quad \frac{di^e}{dt} = -\gamma_1 \cdot (i^e - i) - \gamma_2 \cdot (\iota - \iota^*)^3, \qquad \gamma_1, \gamma_2 > 0$$

where i^e is the expected interest rate, i^* the equilibrium or fundamental interest rate

Differential equations 3.37-3.39 constitute a three-equation non-linear system. The first equation (3.37) says that if expected interest rates i^e are greater than the actual rate i, then actual interest rates will rise. The second equation (3.38) suggests that if actual interest rates are greater than the 'fundamental interest

rate' i^*, then fundamental interest rates will increase. These equations reflect the first two assumptions of reflexivity theory (mentioned under 1), 2) above). The third equation (3.39) relates to the third assumption of the theory (mentioned under 3) above). It indicates that expected interest rates that exceed the actual, and actual interest rates that exceed the fundamental will have a negative impact on the time derivative of expected rates $\frac{di^e}{dt} < 0$. In other words, equation 3.39 suggests that investors will expect the interest rate to move eventual towards the 'fundamental value'.

The system can be reduced to a two 2 x 2 differential equation system by subtracting 3.37 from 3.39 and 3.38, respectively.

3.40 subtracting 3.37 from 3.39 $$\frac{d\varphi^e}{dt} = \frac{di^e}{dt} - \frac{di}{dt} = -(\gamma_1 + \delta) \cdot \varphi^e - \gamma_2 \cdot \varphi^{*3}$$

3.41 $substracting$ 3.38$from$ 3.37 $$\frac{d\varphi^*}{d_t} = \left(\frac{di}{dt} - \frac{di^*}{dt}\right) = \delta \cdot \varphi^e - \beta \cdot \varphi^*$$

Differential equations 3.40 and 3.31 have a solution for $\varphi^* \, and \, \varphi^e$ both equal to zero. the solution means that actual, expected, and fundamental values become equal in equilibrium. The solution is stable as shown by the Jacobean.

3.42 $$J_{0,0} = \begin{bmatrix} -(\gamma_1 + \delta) & 0 \\ \delta & -\beta \end{bmatrix} \rightarrow trace\ T = -(\gamma_1 + \delta) - \beta < 0 \; and \; DET$$
$$= -(\gamma_1 + \delta) \cdot (-\beta) > 0$$

The system pictures a situation where the time paths of actual and expected prices will fluctuate around the time path of the fundamental values. The above indicates that the theory presented by Soros and elaborated herein is different from behavioral finance theories where persistent 'irrational exuberance' prevails (see chapter 2 section 2.d.4). This explains also why the profit-based approach directly applies fundamentals for stock pricing as we will discuss next.