

## Comparisons of the Cycle of Money Based on Enforcement and Escaped Savings

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**Abstract:** This paper is about the cycle of money comparing the case the cycle of money in the case that there exist all the magnitudes of the cycle of money the case that there are avoided the escaping savings, and the case that are avoided enforcement savings. The same comparisons are made for the velocity of the escaping savings, and the same procedure is followed for the case of the enforcement savings. The current results support the main theoretical background of the theory of Cycle of Money, where the enforcement savings have a positive impact on the economy, and on the contrary, the escaped savings have a negative one. The Q.E. method has been applied to this research.

**Keywords:** cycle of money, escaped savings, enforcement savings.

### Introduction

This paper analyzes the cases of the cycle of money when there are used all the magnitudes, when the escaping savings are avoided, and when the enforcement savings are avoided. Moreover, it scrutinizes the case of the cycle of money, when there are used the enforcement savings, and when are avoided. Additionally, proceeded to an analysis of the velocity of escaping savings in three versions, when there are all the factors, when are avoided the escaping savings, and when are avoided the enforcement savings. economy (Challoumis, 2020, 2021c; De Araujo et al., 2020; Engström et al., 2020; Fernandez & Raine, 2019; Gangl & Torgler, 2020; Maier, 2012; Syukur, 2020; Van de Vijver et al., 2020)(Baker et al., 2020; Berg et al., 2020; Gangl & Torgler, 2020; Hagenaars et al., 2017; Levi, 2021).

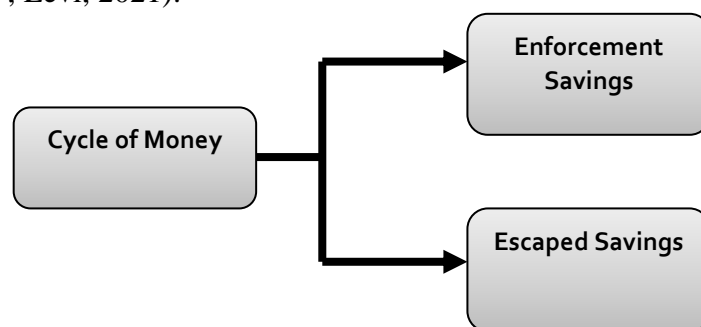


Figure 1: Cycle of money based on enforcement and escaped savings

The contracts and the agreements between the participants of control transactions are those that determine the allocation of profits and losses. The agreements should mention changes that happen in the contracts. This is the reason why the tax authorities should make periodic inspections (Carattini et al., 2018; Carfora et al., 2021; Cascajo et al., 2018; Castaño et al., 2016; Castro & Scartascini, 2019). The periodic specification of contracts is important for comparability analysis. These periodic inspections of the companies that participate in controlled transactions are crucial for the arm’s length principle. Then, the determination of the cost-sharing depends on the periodic

check of companies that are tested parties. The scope of the companies of controlled transactions is to face the issues that are connected with the taxation of their activities (Challoumis, 2023d, 2023e). Therefore, the requirements for the companies of controlled transactions with the tax authorities should be in the range of the arm's length principle. Thereupon, the appropriate agreement of the companies of controlled transactions is that which permits them the maximization of their profits in tax environments with low tax rates, and the maximization of costs in economic environments with high tax rates.

Moreover, should be notified that the companies of controlled transactions and the same time the inspections of tax authorities are done under the condition of proportional adjustments (Fernandez & Raine, 2019; Siegmeier et al., 2018; Urwannachotima et al., 2020; Van de Vijver et al., 2020; Παπακωνσταντίνου et al., 2013). The interpretation of the condition of the proportional adjustments is that the companies that participate in controlled transactions many times don't have the appropriate data and uncontrolled transactions of similar circumstances to compare and therefore they proportionally adjust their data (Challoumis, 2021f, 2021a, 2021d, 2021e, 2021c, 2021g, 2021h, 2021b, 2022b, 2022a, 2023a, 2023c, 2023b). This means that if the companies that are tested parties conclude that the profits and losses of companies from uncontrolled transactions are much higher or much fewer then they make a proportional analogy to compare them with their data.

The production of goods or services creates profits and costs for the companies:

$$u = s(zf + \tilde{z}d) \quad (1)$$

$$z = |\tilde{z} - 1| \quad (2)$$

The symbol  $u$  is about the impact factor of the comparability analysis which has any method to the  $s$ . The symbol  $z$  is a coefficient that takes values between 0 and 1. What value could be received is determined by the influence of the method (using the best method rule) on the  $s$ . The symbol of  $f$  is about the cost which comes up from the production of goods, and the symbol of  $d$  is about the cost which comes from the distribution of the goods. According to prior equations, it is plausible to determine the following equations:

$$u_c = zf + \tilde{z}d \quad (3)$$

$$b = (p - u_c) * j_1 \quad (4)$$

The symbol of  $b$  in the prior equation is about the amount of taxes that should be paid to the companies of controlled transactions in the application of the arm's length principle. The  $u_c$  is the amount of tax obligations that can be avoided through the allocations of profits and losses. Moreover,  $j_1$  is a coefficient for the rate of taxes. Then, the Eq. (4) shows the case of the arm's length principle. In addition, the case of the fixed length principle:

$$v = p * j_2 \quad (5)$$

The symbol of  $v$  in the previous equation shows the taxes that should be paid to the enterprises of controlled transactions in the application of the fixed length principle. Then,  $j_2$  is a coefficient for the rate of taxes in the case of the fixed length principle:

$$v \geq b \tag{6}$$

The tax for the companies that participate in controlled transactions of transfer pricing in the case of the fixed length principle is higher or at least equal to that of the case of the arm’s length principle.

Thereupon, with the fixed length principle the enterprises of controlled transactions can tackle issues that come from the allocation of the profits and losses. Therefore, the tax authorities can face the transfer pricing effects on the global tax revenue.

The fixed length principle permits to recovery of the tax losses of the global tax revenue from the controlled transactions of the transfer pricing.

The next section presents the theory of the cycle of money. Moreover, the methodology which followed stands on the Q.E. method.

**Literature Review**

The tax revenues correspond to the savings that the companies could have if the taxes were avoided. The way that these savings are administrated is different from case to case. Then the benefits of the companies could be managed in a completely different way, as could be saved or taxed (De Araujo et al., 2020; Gong et al., 2020; Kominers et al., 2017; Maier, 2012; Olcina et al., 2020; Paes-Sousa et al., 2019). The theory of the cycle of money shows when the savings robust the economy and when the taxes robust the economy/ It is crucial for this determination to be a separation of savings into the non-returned savings (or escaped savings) and the returned savings (or enforcement savings). For the scope of this analysis below are demonstrated the equations which are:

$$\alpha = \alpha_s + \alpha_t \text{ or } \frac{1}{v} + \alpha_t \tag{7}$$

$$x_m = m - a \tag{8}$$

$$m = \mu + \alpha_p \tag{9}$$

$$\mu = \sum_{i=0}^n \mu_i \tag{10}$$

$$\alpha_p = \sum_{j=0}^m \alpha_{pj} \tag{11}$$

$$c_m = \frac{dx_m}{dm} \tag{12}$$

$$c_\alpha = \frac{dx_m}{d\alpha} \tag{13}$$

$$c_y = c_m - c_\alpha \tag{14}$$

The variable of  $\alpha$  is symbolized the case of the escaped savings. This means that there are savings that are not returning to the economy, or come back after a long-term period. The variable of  $\alpha_s$  symbolizes the case that there are escaped savings that come from transfer pricing activities. The variable of  $\alpha_t$  symbolizes the case that there are escaped savings not from transfer pricing activities but from any other commercial activity. For instance  $\alpha_t$  could refer to the commercial activities

that come from uncontrolled transactions. The variable of  $m$  symbolizes the financial liquidity in an economy (Challoumis, 2019a, 2019b). The variable of  $\mu$  symbolizes the consumption in an economy. The variable of  $\alpha_p$  symbolizes the enforcement savings, which come from the citizens and small and medium-sized enterprises. The variable of  $x_m$  symbolizes the condition of financial liquidity in an economy. The variable of  $c_m$  symbolizes the velocity of financial liquidity increases or decreases. The variable of  $c_\alpha$  symbolizes the velocity of escaped savings. Therefore, the variable of  $c_y$  symbolizes the term of the cycle of money. Thereupon, the cycle of money shows the level of the dynamic of an economy and its robustness.

Then, the basic principles of the cycle of money:

- The citizens, the small and the middle-sized enterprises substitute the services and the property of the companies which save their money and not invest them or consume it proportionally in the economy. Thereupon, the companies of the controlled transactions are the main cause of the escape savings.
- The escaped savings are responsible for the decline of the economic dynamic of the economy. The key point of escape savings is that the companies of controlled transactions of transfer pricing are responsible for not reentering these amounts of money in the market. This situation causes a lack of financial liquidity in an economy.
- The substitution-controlled transactions are not substituted from the citizens and the small and middle-sized companies when it is not plausible to offer the same added value to the products and the services. This case happens especially in the instance of factories, in the research centers, etc. Therefore, these cases in the appropriate tax policy should be taxed as uncontrolled transactions independently if they participate in controlled transactions (using the fixed length principle).
- The enforcement savings are responsible for the high economic dynamic of the economy. Therefore, investments and consumption are elements that come from the savings of the citizens and the small and the middle-sized companies.
- The velocity of financial liquidity shows how rapidly the economy's robustness grows or declines accordingly. Then is an index for how well structured is any economy.
- The velocity of escaped savings shows how rapidly the non-return savings are lost from the market, or by the lack of investments, or by the lack of consumption.
- The cycle of money represents the condition of the economy. The level of a well-structured tax system, and in general the dynamic of the economy. If this indicator is high then the economy could have high robustness otherwise has low financial liquidity.
- Controlled transactions in the theory of the cycle of money are considered not only the cases of transfer pricing, but any kind of administration of profits and losses to avoid taxation.
- Uncontrolled transactions in the theory of the cycle of money are the case of the commercial activity of citizens, small and medium-sized enterprises, factories, research centers, and any kind of commercial activity that cannot be substituted by the companies of controlled transactions.

- The fixed length principle tackles issues subjects like the case cycle of money. But, this doesn't mean that restriction must apply the fixed length principle as the cycle of money is more widely theory which exceeds the transfer pricing scope.

Therefore, it is obtained that the cycle of money grows when there is a tax system like the case of the fixed length principle which permits the low taxation of the uncontrolled transactions and the higher taxation of controlled transactions. Should be mentioned that as uncontrolled transactions are considered the same happens with the cases of the financial liquidity of citizens and the small and middle size companies. For the ideal case of the cycle of money:

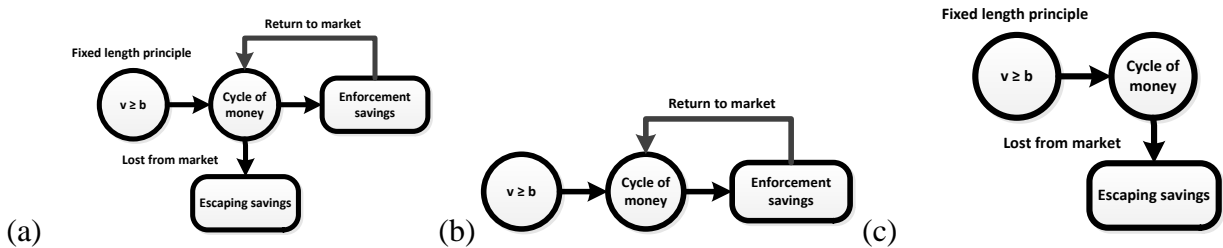


Figure 2: (a) Cycle of money (b) Ideal case of cycle of money

Fig. 2 (a) shows the case of the escaping savings and the enforcement savings. Then, there is a connection between the higher tax policy for the controlled transactions and the lower tax policy for the uncontrolled transactions which is supported by the fixed length principle. In the model of the cycle of money without the escaping savings [Fig. 2(b)] concluded the ideal case where no lost savings happen in the market. Therefore, in the second scheme, there is an economy whose economic dynamic is at the maximum level. In the model of the cycle of money without the enforcement savings [Fig. 2(c)] determined the worst hypothetical case where lost savings happen in the market. Therefore, in the third scheme, there is an economy that is indicated as a low economic dynamic environment.

### Comparisons of the cycle of money based on enforcement and escaped savings

For the mathematical approach to the cycle of money, the prior equations are subject to the next conditions:

$$\alpha \approx 0 \tag{15}$$

$$x_m \approx m \tag{16}$$

$$c_\alpha \approx 0 \tag{17}$$

$$c_y = c_m \tag{18}$$

For the mathematical approach to the cycle of money:

$$\mu > \alpha_p > 0 \tag{19}$$

$$m \approx \mu \tag{20}$$

$$\mu > \alpha_t > \alpha_s > 0 \tag{21}$$

Thus, it is obvious that the case of  $\alpha_s$  omitted. Furthermore, after those specifications, it is applied the Q.E. method:

Factors	Values	Values'	Values''
$\alpha_s$	0.6	0.6	-
$\alpha_t$	0.7	0.7	-
$\mu$	0.9	0.9	0.9
$\alpha_p$	0.8	-	0.8

Table: Compiling coefficients

The generator of this procedure used the coefficients which appeared in the previous table. Therefore, the factors have an upper limit of 1, and a lower limit of 0, but  $s$  and  $\tilde{s}$  are plausible to receive values greater than one as their mathematical structure allows this. After 461 iterations the following diagram:

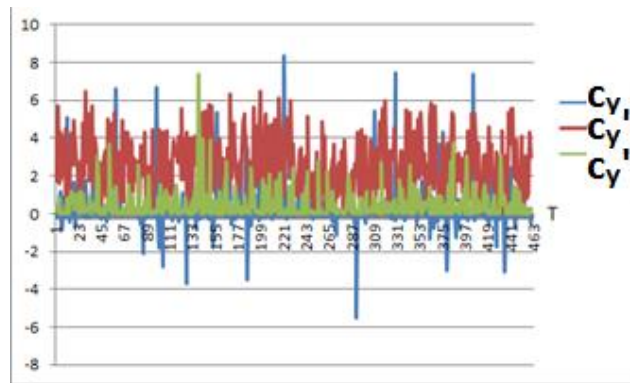


Figure 3: Comparisons of the cycle of money

Fig. 3 determines the behavior of the cycle of money in the case that there is used all the factors, the case that the escaped savings are omitted, and finally the case that the enforcement savings are avoided. Hence, it is concluded as was expected that when the escaping savings are not included in an economy the cycle of money is at its higher level (case of  $c_y'$ ). Additionally, on the other hand when the cycle of money is avoided the enforcement savings there is an economy in its lower level (case of  $c_y$ ):

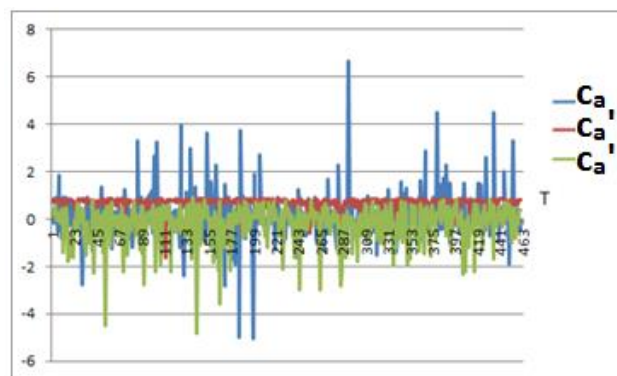


Figure 4: Comparisons of the velocity of escaping savings

Fig. 4 shows that the velocity of escaping savings is in its lower case in the third case of  $c_a''$ . In combination with Fig. 3, it is obtained the relation of the cycle of money with the velocity of escaping savings. It is concluded that when the enforcement savings are omitted the cycle of money and the velocity of the escaped savings are closely connected. It is obtained that when



escaped savings have a negative impact on the economy the cycle of money is at its lower level. As in this version, the enforcement savings are omitted, and this has an impact on the escaping savings making them have a much more negative influence on the economy

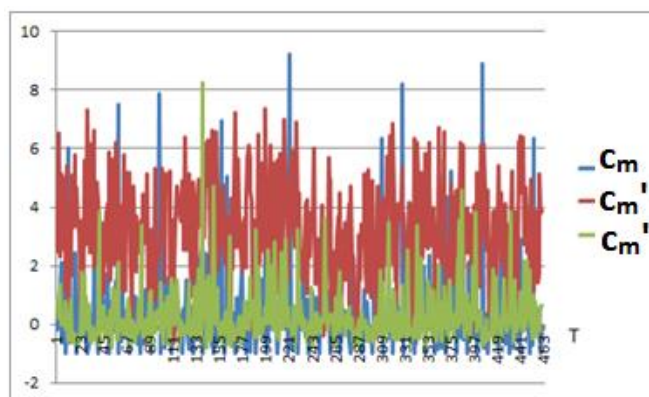


Figure 5: Comparisons of velocity of financial liquidity

In the last figure, it is obtained the behavior of the velocity of financial liquidity under different circumstances. Therefore, it is concluded that the case of absence of escaping savings caused a very positive impact on the economy. In the case of  $c_m'$  the velocity of financial liquidity is at its higher level.

**Conclusion**

This paper examined the behaviors of the cycle of money, the velocity of the escaping savings, and the velocity of the enforcement savings. Therefore, it is concluded that when escaping savings is avoided the economic dynamic environment of an economy is at its higher level. But, on the other hand, when the velocity of financial liquidity is at a higher level then the cycle of money is also at a higher level.

**Appendix**

```
% Q.E. method (C)(R)2017 Constantinos Challoumis

t1=0;
while t1<10
    t1=t1+1;

    if rand()<9
        as=0.6*rand();
    end

    if rand()<9
        at=0.7*rand();
    end

    if rand()<9
        m1=0.9*rand();
    end
end
```

```

if rand()<9
    ap=0.8*rand();
end
syms t
%diff and sym no need for ;
a=as+at;
m=m1+ap;
xm=m-a;
cm=xm/a;
ca=xm/m;
cy=cm-ca;

tab=[a,xm,m,cm,ca,cy];
end

```

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