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The Cycle of Money with Mixed Savings

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Abstract

This paper is about the utility of cycle of money with mixed savings. This means that it examines the crucial points of tax policy and public policy that are the best for the increase of consumption and investments, subject to the case that there exists and the case that there is an absence of mixed savings. Therefore, the analysis is based on the utility of the public sector and the utility of the uncontrolled enterprises. Thence, it is plausible to extract conclusions about the utility of the cycle of money, showing the points and the behaviors of any economy when there are and when there are not mixed savings. For this analysis, a Q.E. method and its econometrical approach are applied.

Keywords: public policy, tax policy, cycle of money, mixed savings.

1. Introduction

This paper analyzes the utility of cycle of money with mixed savings. The examination of the cycle of money with mixed savings is plausible through the use of factories, research centers, development centers, and any kind of transactions that cannot be substituted by the middle/small enterprises and by the citizens (and generally the uncontrolled transactions). Thence, after estimations the utility graphs, which used to obtain the behavior of the cycle of money with the mixed savings.

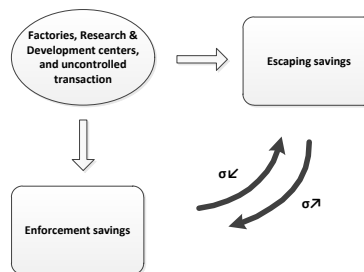


Figure 1. Mixed savings

In the previous scheme, it is concluded that the impact factor of the balanced tax income is increased in the case that there are factories, research centers, development centers, and any other non-substitute transactions by the middle/small enterprises and the citizens. In contradiction, there are the opposite results when these factors are avoided or not used in the appropriate extension.

The contracts and the agreements between the participants of control transactions are those that determine the allocation of profits and losses (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; Hagenaaers et al., 2017; Levi, 2021). 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 (Burstein, 2020; Cruz-Castro & Sanz-Menéndez, 2016; Haigh, 2020; Jeon et al., 2020; Peres et al., 2020; Rasmussen & Callan, 2016; Torres Salcido et al., 2015). 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 to control transactions with the tax authorities should be in the range of the arm's length principle (Challoumis, 2019a, 2019b). 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.

Furthermore, the companies of controlled transactions should be estimated tax authorities' inspections are conducted under the condition of proportional adjustments. (Fernandez & Raine, 2019; Siegmeier et al., 2018; Urwannachotima et al., 2020; Van de Vijver et al., 2020; Παπακωνσταντινίου et al., 2013). The interpretation of the proportional adjustments condition is that companies that participate in controlled transactions frequently lack the appropriate data and uncontrolled transactions of similar circumstances to compare, so they proportionally adjust their data. (Challoumis, 2021a, 2021h, 2023b, 2023c, 2023a, 2021g, 2021f, 2021b, 2021c, 2021e, 2021d, 2022b, 2022a). This means that if the tested parties conclude that the profits and losses of companies from uncontrolled transactions are significantly higher or significantly lower, they use a proportional analogy to compare them with their data.

2. Literature review

The tax revenues correspond to the savings that businesses could realize if taxes were avoided. How these savings are administered varies from case to case. The benefits of the companies could then be managed in a completely different way, such as savings or taxation (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:

$$\alpha = \alpha_s + \alpha_t \text{ or } \frac{1}{v} + \alpha_t \quad (1)$$

$$x_m = m - a \quad (2)$$

$$m = \mu + \alpha_p \quad (3)$$

$$\mu = \sum_{t=0}^n \mu_t \quad (4)$$

$$\alpha_p = \sum_{j=0}^m \alpha_{pj} \quad (5)$$

$$c_m = \frac{dx_m}{dm} \tag{6}$$

$$c_\alpha = \frac{dx_m}{da} \tag{7}$$

$$c_y = c_m - c_\alpha \tag{8}$$

The variable of α symbolizes 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 α_s symbolizes the case that there are escaped savings that come from transfer pricing activities. The variable of α_t symbolizes the case that there are escaped savings not from transfer pricing activities but from any other commercial activity. For instance, α_t could refer to the commercial activities that come from uncontrolled transactions. The variable of m symbolizes the financial liquidity in an economy. The variable of μ symbolizes the consumption in an economy. The variable of α_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_α 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.

$$\alpha_p = \alpha_r + \alpha_n * h_n + \alpha_m * h_m \tag{9}$$

$$\alpha_r \geq \alpha_n * h_n \geq \alpha_m * h_m \tag{10}$$

In the prior two equations used some impact factors, which are the α_p which was also presented previously, moreover the variables $\alpha_r, \alpha_n, h_n, \alpha_m$ and the h_m . The variable α_r symbolizes the impact factor of the rest rewarding taxes. The symbol of α_n is the impact factor of education and any technical knowledge. The symbol of α_m is about the impact factor of health anything relevant and supporting of this issue. The symbol of h_n , and of the h_m , are the coefficients of the health and the health impact factor accordingly.

3. Minimum mixed savings on the Cycle of Money

The mathematical approach of the utility cycle of money has been used for the prior equations subject to the utilities of the next equations, with their conditions:

$$\tilde{U}'(t) = \sum_{j=1}^n [c_m \tilde{U}(t) - c_\alpha U(t)]_j \tag{11}$$

$$U'(t) = - \sum_{j=1}^n [c_\alpha U(t)]_j \tag{12}$$

$$U(0) > 0 \tag{13}$$

$$\tilde{U}(0) > 0 \tag{14}$$

According to the prior definitions should be mentioned that the symbol of $\tilde{U}(t)$ is about the utility of the authorities and therefore of the public sector. The symbol of $U(t)$ is about the utility of the enterprises that participate in controlled transactions. In addition, including the mixed savings a_{mi} :

$$\alpha_r = a_{mi} + \sum_{j=1}^n (\alpha_r)_j \tag{15}$$

$$\alpha_s = \sum_{k=1}^m (\alpha_s)_k \tag{16}$$

$$\alpha_p = \sum_{j=1}^n (\alpha_p)_j = \alpha_r + \alpha_n * h_n + \alpha_m * h_m \tag{17}$$

$$\alpha_t = \sum_{v=1}^d (\alpha_t)_v \tag{18}$$

$$a = \alpha_s + \alpha_t = \sum_{k=1}^m (\alpha_s)_k + \sum_{v=1}^d (\alpha_t)_v \tag{19}$$

$$m = \alpha_p + \sum_{z=1}^q m_z \tag{20}$$

$$0 \leq a_{mi} \leq 1 \tag{21}$$

Folles the compile:

Table 1. Compiling coefficients

<i>Variables</i>	<i>Coefficients</i>
$1 - a_{mi}$	0.6
$\sum_{k=1}^m (\alpha_r)_k$	0.6
α_t	0.7

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 \bar{s} are plausible to receive values greater than one as their mathematical structure allows this. After 461 iterations the following diagram:

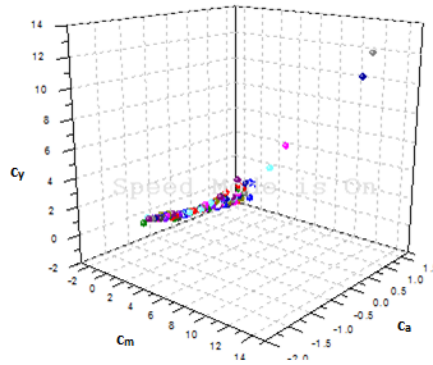


Figure 1. Cycle of money with mixed savings in three-dimension representation

In the previous scheme, it is concluded that in the normal case of the cycle of money (the version that included the escaped and the enforcement savings) is at a positive level as it grows:

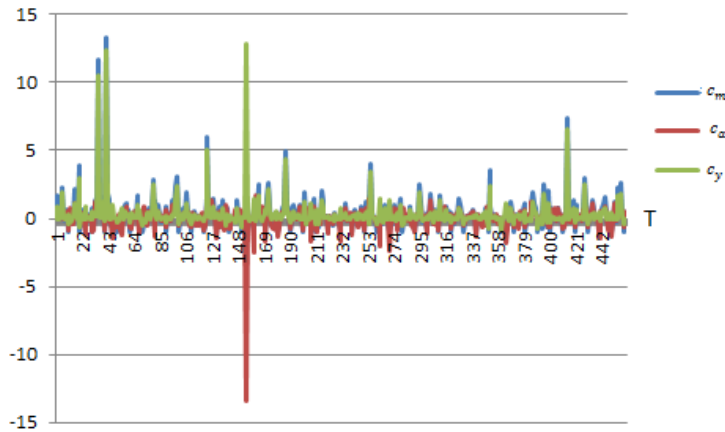


Figure 3. Cycle of money with mixed savings in two-dimension representation

In the prior figure, it is revealed that the cycle of money is at a positive level as was determined in Fig. 1. Thence, the velocity of financial liquidity is at a higher level than the effect of the velocity of escaped savings. Therefore, follows an analysis of the sustainability of the model, using the Q.E. method on its econometric approach:

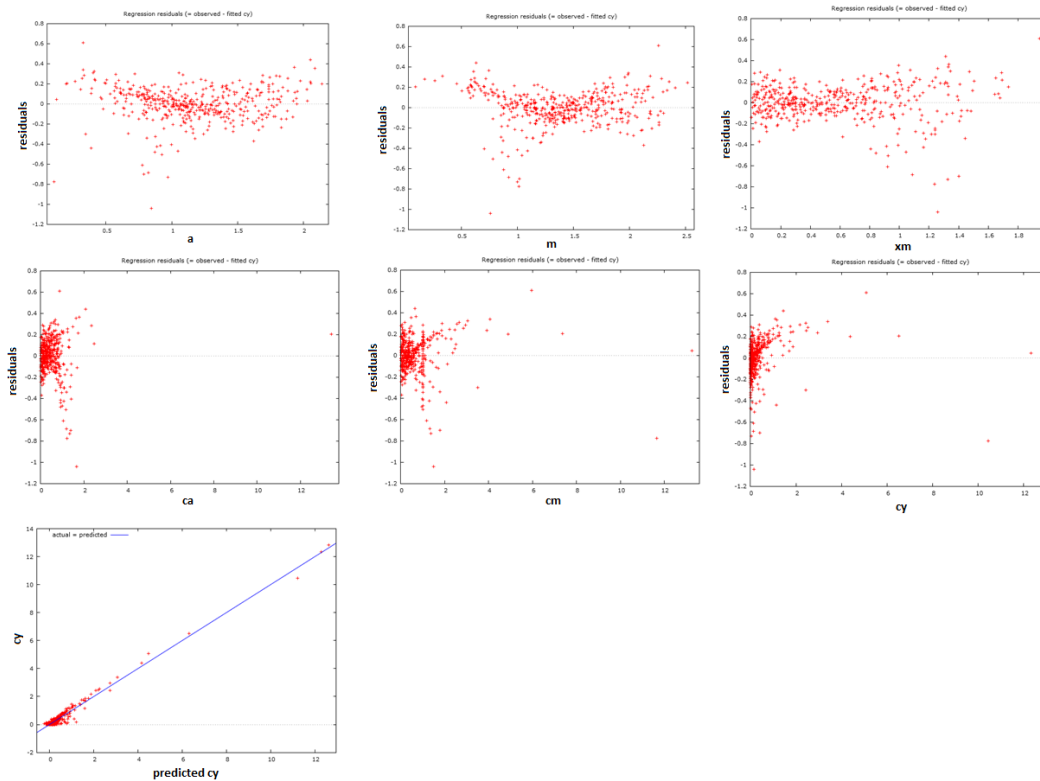


Figure 4. Econometric analysis

From the econometric analysis of the model, it is concluded that it is sustainable as in all cases there is no diversion between the predicted values with the existing ones. Thence, from the data it is clarified that the model is stable.

4. Conclusion

In this paper, it is concluded that the mixed savings in general serve the economy, as the economic dynamic of this economy is high. Therefore, the consumption and investments in this economy are at a high level. The velocity of financial liquidity is higher than the velocity of escaping savings, then the cycle of money grows, and in this situation the mixed savings.

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The author declares no competing interests.

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Appendix

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

as=0;
at=0;
xm=0;
m=0;
m1=0;
ap=0;
cm=0;
ca=0;
cy=0;
t=0;

while t<10
    t=t+1;

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

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

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

    m=(1-am)+ar;
    a=at;
    xm=m-a;
    cm=xm/m;
    ca=xm/a;
    cy=cm-ca;

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



Cultural Entrepreneurship and Economic Situation of the Islands Imbros and Tenedos

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Abstract

Culture highlights a place, through the promotion of tangible and intangible cultural heritage, and it creates an incentive to visit and interest in the mentioned area. The object of interest of this project is Imbros and Tenedos, specifically the economic and cultural development of the islands in recent years. The methodology we followed is qualitative research conducted through an online questionnaire. Also, for the current situation on the islands, we quote the results of qualitative research.

Keywords: Imbros, Tenedos, cultural development, economy, tourism.

1. Economic and cultural resources of the islands

The basic income of the inhabitants of Imbros comes mainly from agriculture and tourism. In recent years, Imbros has started to become an important center for both local and foreign windsurfers, both amateur and professionals thanks to the growing awareness of the characteristics and properties of the wind on the island.

Almost all agricultural activities on the island are carried out with organic farming and Imbros is a candidate to become an important center of Turkey for organic farming. Organic farming activities can be classified into four main groups: animal husbandry, beekeeping, olive growing, viticulture, and winemaking (imvrosisland.org).

Regarding Tenedos, the most popular economic activities of the island are fishing and winemaking. The rest of the cultivated land is covered with olive trees and wheat. Much of the agriculture is done in the central plains and gentle hills of the island. The island's red poppies are used to produce small amounts of sorbet and jam. Animal husbandry flourishes in the hilly areas in the northeast and southeast of the island, which are not suitable for agriculture. In recent years, the number of farmers engaged in viticulture increased from 210 to 397, although the area of viticulture decreased from 1,800 hectares to 1,200 hectares (Kerkineoglou, 2009).

Tourism has been an important but limited economic activity since the 1970s but its rapid growth can be observed since the 1990s. The island's main attraction is the castle, last rebuilt in 1815, illuminated at night, and has a view of the sea. The history of the island is reflected in a small museum, with a room dedicated to its Greek history. The town square features a “morning market” selling fresh groceries and seafood, along with the island's specialty, tomato jam. In addition, the residents of mainland Istanbul have a few bars, boutiques, and guesthouses (Maniou, 2023)

In 2010, the island was named the second most beautiful island in the world by Condé Nast's Readers' Choice Awards. The following year, the island topped the same magazine's readers' list of the 10 best islands in Europe. In 2012, Condé Nast again selected Tenedos as one of the 8 best islands in the world due to the remains of ancient buildings, less crowded beaches, and places to stay. Fishing plays an important role in the island's economy, but as in other Aegean islands, agriculture is the most important economic activity. The local fishing industry is small but active year-round, with the port authority counting 48 vessels and 120 fishermen in 2011. The industry has benefited from increased tourism and the resulting demand for more seafood. During the migration season, boats from abroad come to the island to fish.



Picture 1. Castle of Tenedos

In 2000, a wind farm with 17 turbines was established in the Western Cape. It has a rated power of 10.2 MW and produces 30 GWh of electricity per year. This is far more than the island needs and the surplus is transported to mainland Anatolia via an underground and partly subsea cable. Overhead cables and pylons were avoided to preserve the scenic view. The land has an average wind speed of 6.4 m/s, and its weather station has an average energy density of 324 W/m. This shows the huge potential of wind energy. Also, a project of the United Nations Industrial Development Organization (UNIDO), the International Center for Hydrogen Energy Technologies (ICHET) has set up an experimental hydrogen renewable energy facility. The power plant generates energy through a 20-kW solar photovoltaic array and uses a 50-kW electrolyte to store this energy as hydrogen. A fuel cell and hydrogen engine can convert this stored energy back into electricity when needed, and the experimental system can power up to 20 households per day. In 2012, the Turkish government opened a customs office on the island, paving the way for future direct travel between Greek ports and the island.

2. Cultural resources

In Tenedos, Bozcaada Castle is regarded as a trademark, located in the northeast of the island, and it already was a castle on the island before the 14th century, probably built by the Phoenicians, the Romans, or the Venetians. However, the castle was demolished after the War of Chioggia between Venice and Genoa on the advice of the Pope. When Mehmet II of the Ottoman Empire conquered the island in 1455, he rebuilt the castle. In July 1656, during the Cretan War, the Venetian fleet commanded by Giacomo Lorentano captured the castle. But the Ottomans under Köprülü Mehmet Pasha recaptured the castle in August 1657, and after the recapture, the castle underwent major renovations. A second renovation was carried out in 1815 by Sultan Mahmud II. Then, the Bozcaada Museum was established to understand the history of the cultures and people of Tenedos in all their diversity, using cultural materials that illuminate the local history. The Church of Panagia, which is the only church that is currently open for Orthodox worship, is in the heart of the Greek neighborhood. The date “1869” was posted on its door, as its first construction dates to the time of the Venetians (Kerkineoglou, 2009).

In Imbros, many churches have been renovated in recent years, including the Metropolitan, as well as chapels. More and more Imbrians, from all over the world, are returning to their place, especially in times of economic crisis (imvrosisland.org). The natural beauties of the island include Aydınçık/Kefaloz beach, which is ideal for surfing and is developed for tourism, Spilia (Pınarbaşı) which is the largest source of water on the island, and Livunia, a huge unexploited tourist beach west of the island. Thanks to some enlightened and particularly gifted people, interesting aspects and expressions of the cultural identity of the island and its people have been saved. All these are elements of the intangible heritage of the island such as the local linguistic idiom, myths, and legends, traditions, proverbs, fairy tales, proverbs and riddles, publishing activities, and folk arts (imvrosisland.org).



Picture 2. Church in Imbros

3. Cultural and economic development in Imbros and Tenedos

Imbros's significant income today comes mainly from the tourists who visit the island every year and admire its sights and beaches. In Imbros, the island's carnival is held every year, which gathers visitors and consequently contributes to the island's economy. Also, places of interest are the villages decorated in the traditional architecture of the island with the inhabitants using the local language idiom (Maniou, 2011). The main ones are Schinouidi, Glyky, Panagia, Agridia, and Agioi Theodoroi. The Imbrians, according to Fotiadis (2014), learned from the Mytilenians how to make milk while they were also introduced to the secrets of the olive tree. In addition, they learned everything they needed to know about funding applications from Turkish ministry officials as well as the island's business potential through a meeting organized by the

Association of Roman Community Institutions Support Implementations. From 2012 to 2014, the association implemented the first program on human rights intending to inform citizens about the rights and possibilities provided by the state. Imbros, Tenedos, Constantinople, and Antioch have stepped up in this program (Fotiadis, 2014).

The culture of Imbros is depicted through its monuments which testify to the various phases of its history. Today in Imbros there are churches and chapels. Also, in Imbros, there is a museum called “Gokceada City Museum” which has exhibits showing the various phases of the island's history (imvrosisland.org).

As is the case with Imbros, the cultural development of Tenedos is mainly based on the monuments it has as well as the places of cultural interest. One of the main monuments of Tenedos is the castle, which is said to have been built in 1100 during the Genoese era (emprosnet.gr). Today, exhibitions and other events are held in the castle area. In Tenedos, there is the Greek Orthodox monastery “Ayasma”, which was built in 1734. It is open for worship only on Saint Paraskevi, on 26 July and this date is a place of pilgrimage and meeting and celebration of Tenedians located anywhere in the world (canakkale.com).

4. Touristic development

In recent years, Tenedos has seen great touristic development. Hotels have been built, while many Greek houses have been converted into guesthouses (Manola & Papagrigoriou, 2020). The image of Tenedos no longer has anything to do with the image of the 1960s and 1970s. Many of the tourists are from Greece, while many Tenedians from various parts of the world visit the island to worship the holy lands of their homeland. Efforts are being made to preserve traditions such as the festival of St. Paraskevi, as well as for the maintenance of the church, the residence of the metropolitan, and the few chapels still standing. The Dormition bell tower was recently reconstructed by the Turkish government, as it had been demolished for safety reasons because it had started to collapse. All this is a last-ditch effort to not eliminate the Greek culture from the island (Kerkineglou, 2009).

Imbros is also one of the most important tourist destinations in northern Aegean, it has a cultural heritage and natural beauty with pristine coastal areas that attract domestic and foreign tourists. In recent years, as the area is very windy, it has become a center of interest for windsurfing and kiteboarding enthusiasts. Athletes from Greece, Bulgaria, and Romania enjoy activities on the island. The area's water sports facilities increase tourist interest for visitors (imvrosisland.org).



Picture 3. Imbros

5. Qualitative research of the author

5.1 Interview of Christos Kalfa, president of CLUB OF TENEDIANS "THE TENNIS", 01.02.2020, newspaper "Proto Thema" (Stoukas, 2020)

"Today, few Greeks live permanently on the island. About 10-12 people. 4 middle-aged people, returned in recent years. The Tenedians, having sold their properties in the past, no longer have dwellings to live in. Since ancient times, Tenedos was famous for its vines and wine. When the Greeks left, the Turks, unable to continue wine production, turned to tourism. Thus, today the island is a tourist destination for the elite of Turkey. The prices of the buildings are unapproachable. A half-demolished building in the center of Tenedos is being sold for up to 300,000E! "Mykonos of Turkey", Tenedos is often called as (Stoukas, 2020).

There are several Tenedians who want to return to the island. Although several properties were returned by the Turkish state, the islanders ask the Greek State for moral support, a ferry connection to Lemnos or Lesbos, and help in creating a customs office on the island, which Turkey accepts. On the island, there has been no priest since 2005. On 26 July, the day of Agia Paraskevi, every year hundreds of Tenedians return to the island, in a unique ritual. The Epiphany in Tenedos is also special, resulting in many Greeks also going to the island" (Stoukas, 2020).

5.2 Interview (over the phone) with elder Zacharoula Pitsiladi, 30/09/2022

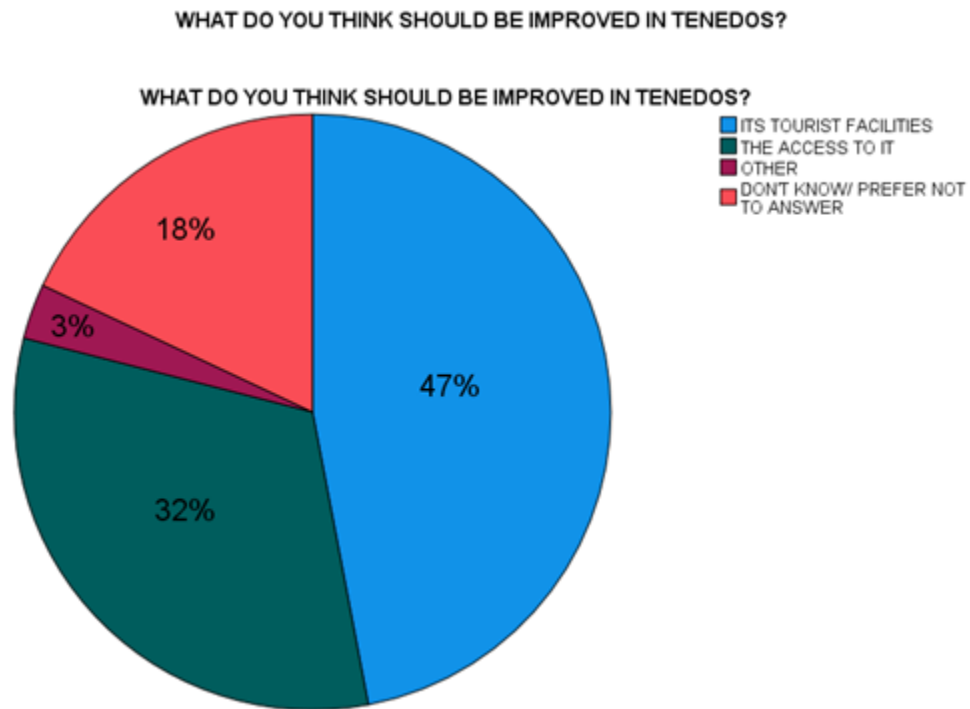
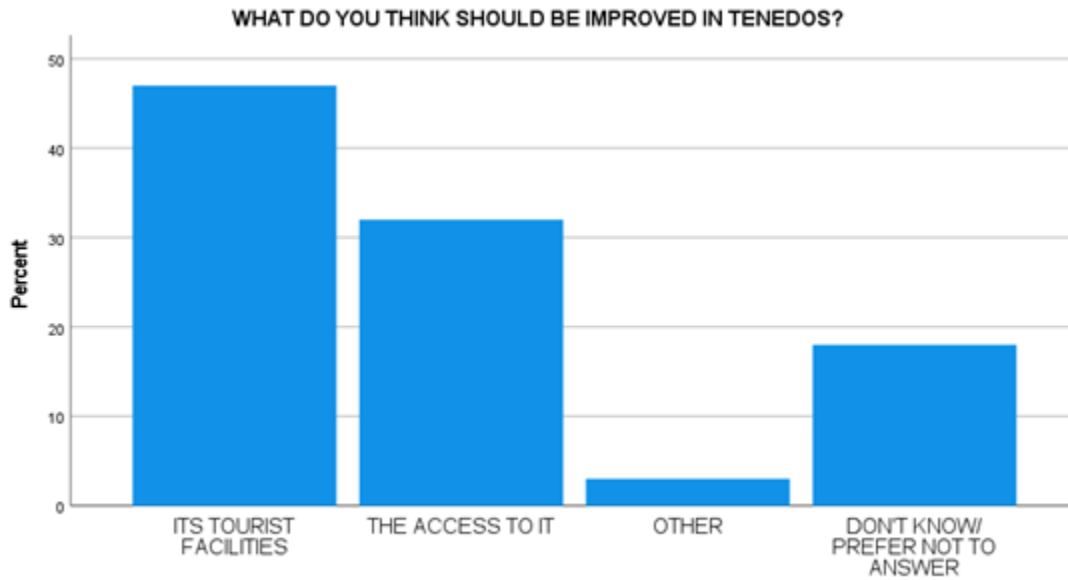
"We have been here since the beginning of 2002. The church works continuously on Sundays and holidays even if it is necessary for me and the priest to be there. Now, there are 12 permanent Greeks on the island. Sometimes Turks come to the congregation, probably descendants of Christians or tourists who light a candle. The big problem is communication with Greece. As far as living with the Turks is concerned, we are very pleased because they benefit us very well and I believe that they are good-natured people. An important incentive for residents to return to Imbros is the Patriarchate's allowance for teachers and children who now amount to 60 in elementary and six-form middle schools."

"Tourism in the summer on the islands is impressive. There are times when visitors reached 70,000 in Tenedos alone. Mainly Turks from mainland Turkey. There are many hotels and houses for accommodation, but you still need to book an appointment 20 days before visiting."

6. Quantitative research of the author: Statistical analysis¹

As part of the work, an online questionnaire survey was conducted. 100 people participated in the research, of which 55 were men and 45 were women. Of these, 48 have finished secondary education, 22 have finished primary education, and 30 have finished tertiary education. The 58 had visited one of the two islands. According to the survey, what should be improved in Imbros is its tourist facilities with 50 votes, and access to the island with 29 votes, while 19 answered I don't know/don't answer and 2 answered otherwise to the corresponding questions about Tenedos. To what needs to be improved in Tenedos, 47 answered its tourist facilities, 32 answered access to it, 18 answered I don't know/don't answer, and 3 answered other.

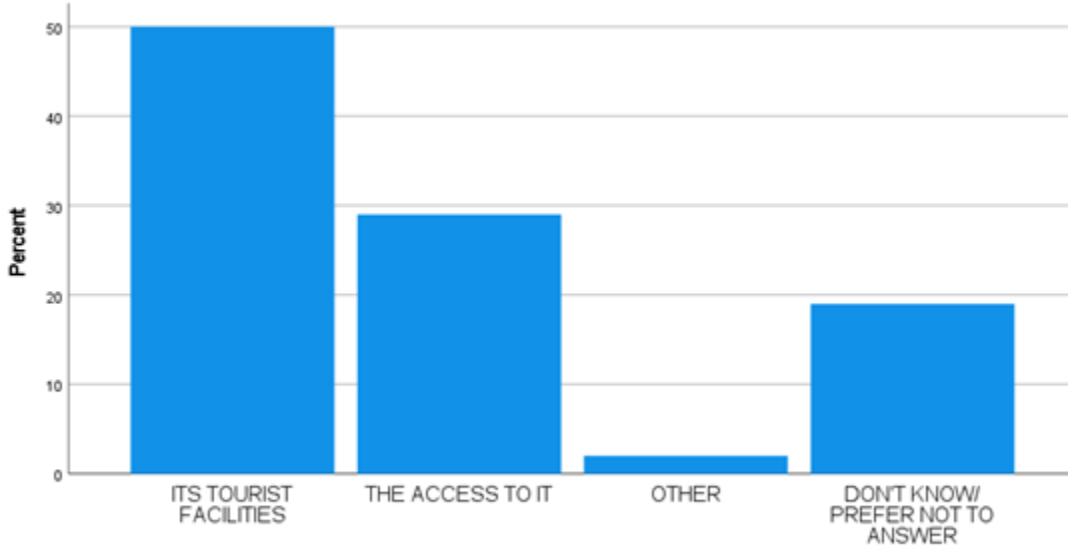
¹ <https://docs.google.com/forms/d/16t1ha4qbzmBSzpEBHa718TcmDAZtWasTorecXcppvfl/viewanalytics>.



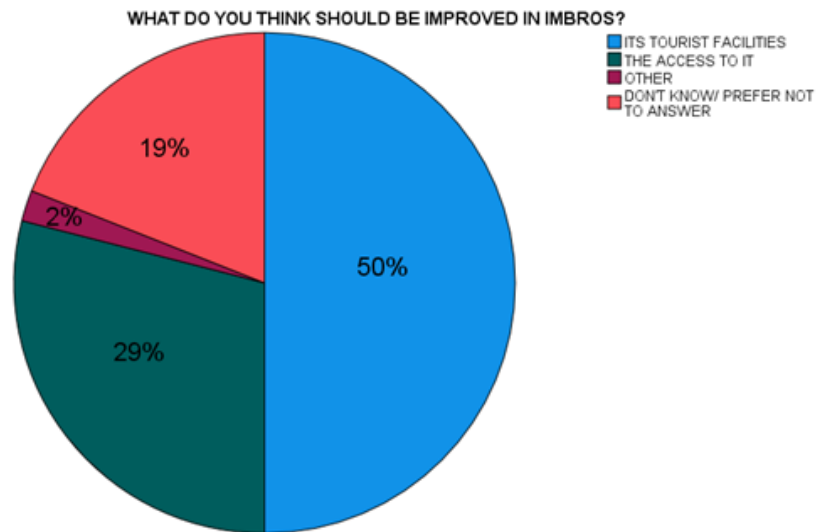
WHAT DO YOU THINK SHOULD BE IMPROVED IN TENEDOS?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	ITS TOURIST FACILITIES	47	47.0	47.0	47.0
	THE ACCESS TO IT	32	32.0	32.0	79.0
	OTHER	3	3.0	3.0	82.0
	DONT KNOW/ PREFER NOT TO ANSWER	18	18.0	18.0	100.0
Total		100	100.0	100.0	

WHAT DO YOU THINK SHOULD BE IMPROVED IN IMBROS?



WHAT DO YOU THINK SHOULD BE IMPROVED IN IMBROS?



WHAT DO YOU THINK SHOULD BE IMPROVED IN IMBROS?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	ITS TOURIST FACILITIES	50	50.0	50.0	50.0
	THE ACCESS TO IT	29	29.0	29.0	79.0
	OTHER	2	2.0	2.0	81.0
	DONT KNOW PREFER NOT TO ANSWER	19	19.0	19.0	100.0
	Total	100	100.0	100.0	

7. Conclusion

Imbros and Tenedos are two islands with a rich history and culture. They are two islands with beautiful and unusual landscapes that are adored by both the locals and their visitors. According to the results of the quantitative research, the issue of communication between the two islands is considered the dominant problem. It is a burning issue for Greeks of any background and origin. A few days ago, the line with Smyrna from Thessaloniki opened twice a week, while in the summer of 2022, the line Smyrna-Plomariu opened with great success. We consider it a good opportunity to do the same for Imbros-Tenedos. The data of both quantitative and qualitative research agree on this.

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The author declares no competing interests.

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Picture 1: Castle of Tenedos. Source from: <https://www.protothema.gr/stories/article/970954/tenedos-to-ellinikotato-nisi-pou-egine-paradeisos-tis-tourkikis-elit/>

Picture 2: Church in Imbros. Source from: <https://www.pemptousia.gr/photo/ekklisies-ke-xokklisia-tis-imbrou/>

Picture 3 Imbros. Source from: <https://eribbing.com/el/%CE%B2%CF%8C%CF%81%CE%B5%CE%B9%CE%BF-%CE%B1%CE%B9%CE%B3%CE%B1%CE%AF%CE%BF/110-stin-polypathi-imbros.html>



Minimum Mixed Savings on Cycle of Money

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Abstract

This paper is about the utility of the cycle of money with minimum mixed savings. This means that it examines the crucial points of tax policy and public policy that are the best for the increase of consumption and investments, subject to the case that there exists mixed savings at the minimum level. Therefore, an analysis is based on the utility of the public sector and the utility of the uncontrolled enterprises. Thence, it is plausible to extract conclusions about the utility of the cycle of money, showing the points and the behaviors of any economy when there are mixed savings and omitted escaped savings. For this analysis is applied the Q.E. method and its econometrical approach.

Keywords: minimum mixed savings, cycle of money.

1. Introduction

This paper analyzes the cycle of money with the minimum mixed savings. The examination of the cycle of money with mixed savings is plausible through the use of factories, research centers, development centers, and any kind of transactions that cannot be substituted by the middle/small enterprises and by the citizens (and generally the uncontrolled transactions). Thence, after estimations the utility graphs, which used to obtain the behavior of the cycle of money with the minimum mixed saving. It is concluded that the impact factor of the balanced tax income is increased in the case that there are factories, research centers, development centers, and any other non-substitute transactions by the middle/small enterprises and the citizens. Additionally, when the escaped savings are omitted, there is a tendency to minimize the level of the cycle of money.

The contracts and the agreements between the participants of control transactions are those that determine the allocation of profits and losses (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; Hagenaaars et al., 2017; Levi, 2021). 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 (Burstein, 2020; Cruz-Castro & Sanz-Menéndez, 2016; Haigh, 2020; Jeon et al., 2020; Peres et al., 2020; Rasmussen & Callan, 2016; Torres Salcido et al., 2015). 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 to control transactions with the tax authorities should be in the range of the arm's length principle (Challoumis, 2019a, 2019b). 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.

Furthermore, the companies of controlled transactions should be estimated tax authorities' inspections are conducted 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 proportional adjustments condition is that companies that participate in controlled transactions frequently lack the appropriate data and uncontrolled transactions of similar circumstances to compare, so they proportionally adjust their data. (Challoumis, 2021a, 2021h, 2023b, 2023c, 2023a, 2021g, 2021f, 2021b, 2021c, 2021e, 2021d, 2022b, 2022a). This means that if the tested parties conclude that the profits and losses of companies from uncontrolled transactions are significantly higher or significantly lower, they use a proportional analogy to compare them with their data.

2. Literature review

The tax revenues correspond to the savings that businesses could realize if taxes were avoided. How these savings are administered varies from case to case. The benefits of the companies could then be managed in a completely different way, such as savings or taxation (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:

$$\alpha = \alpha_s + \alpha_t \text{ or } \frac{1}{v} + \alpha_t \quad (1)$$

$$x_m = m - a \quad (2)$$

$$m = \mu + \alpha_p \quad (3)$$

$$\mu = \sum_{t=0}^n \mu_t \quad (4)$$

$$\alpha_p = \sum_{j=0}^m \alpha_{pj} \quad (5)$$

$$c_m = \frac{dx_m}{dm} \quad (6)$$

$$c_\alpha = \frac{dx_m}{da} \quad (7)$$

$$c_y = c_m - c_\alpha \quad (8)$$

The variable of α symbolizes 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 α_s symbolizes the case that there are escaped savings that come from transfer pricing activities. The variable of α_t symbolizes the case that there are escaped savings not from transfer pricing activities but from any other commercial activity. For instance, α_t could refer to the commercial activities that come from uncontrolled transactions. The variable of m symbolizes the financial

liquidity in an economy. The variable of μ symbolizes the consumption in an economy. The variable of α_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_α 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.

$$\alpha_p = \alpha_r + \alpha_n * h_n + \alpha_m * h_m \tag{9}$$

$$\alpha_r \geq \alpha_n * h_n \geq \alpha_m * h_m \tag{10}$$

In the prior two equations used some impact factors, which are the α_p which was also presented previously, moreover the variables $\alpha_r, \alpha_n, h_n, \alpha_m$ and the h_m . The variable α_r symbolizes the impact factor of the rest rewarding taxes. The symbol of α_n is the impact factor of education and any technical knowledge. The symbol of α_m is about the impact factor of health anything relevant and supporting of this issue. The symbol of h_n , and of the h_m , are the coefficients of the health and the health impact factor accordingly.

3. Minimum mixed savings on the cycle of money

The mathematical approach of the utility cycle of money has been used for the prior equations subject to the utilities of the next equations, with their conditions:

$$\tilde{U}'(t) = \sum_{j=1}^n [c_m \tilde{U}(t) - c_\alpha U(t)]_j \tag{11}$$

$$U'(t) = - \sum_{j=1}^n [c_\alpha U(t)]_j \tag{12}$$

$$U(0) > 0 \tag{13}$$

$$\tilde{U}(0) > 0 \tag{14}$$

According to the prior definitions should be mentioned that the symbol of $\tilde{U}(t)$ is about the utility of the authorities and therefore of the public sector. The symbol of $U(t)$ is about the utility of the enterprises that participate in controlled transactions. In addition, including the mixed savings a_{mi} :

$$\alpha_r = a_{mi} + \sum_{j=1}^n (\alpha_r)_j \tag{15}$$

$$\alpha_s = \sum_{k=1}^m (\alpha_s)_k \tag{16}$$

$$\alpha_p = \sum_{j=1}^n (\alpha_p)_j = \alpha_r + \alpha_n * h_n + \alpha_m * h_m \tag{17}$$

$$\alpha_t = \sum_{v=1}^d (\alpha_t)_v \tag{18}$$

$$a = \alpha_s + \alpha_t = \sum_{k=1}^m (\alpha_s)_k + \sum_{v=1}^d (\alpha_t)_v \tag{19}$$

$$m = \alpha_p + \sum_{z=1}^q m_z \tag{20}$$

$$0 \leq a_{mi} \leq 1 \tag{21}$$

The a_{mi} represents the mixed savings. Thus, follows the compile:

Table 1. Compiling coefficients

Variables	Coefficients
1 - a_{mi}	0.8

$\sum_{k=1}^m (\alpha_r)_k$	0.6
α_t	0.7

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 is:

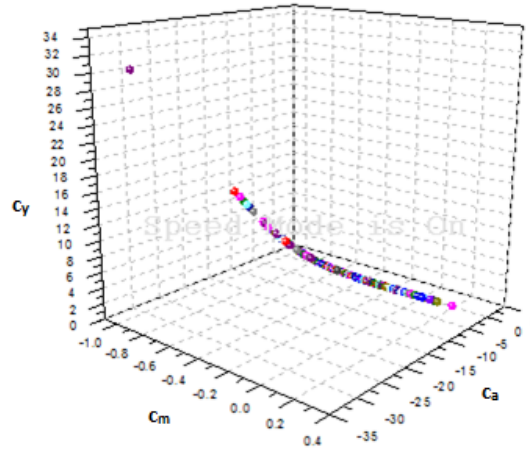


Figure 1. Cycle of money with minimum mixed savings in three-dimension representation

In the previous scheme, it is obtained that in the case of the cycle of money (the version that included the escaped and the enforcement savings) is in a negative orientation which tends to be at its minimum level:

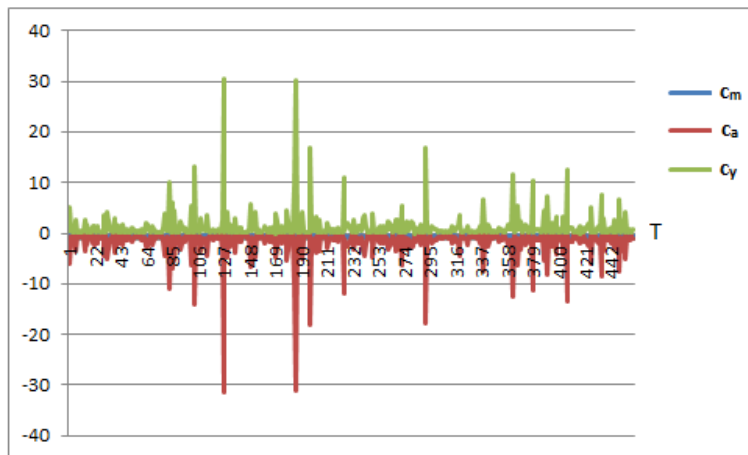


Figure 2. Cycle of money with the minimum mixed savings in a three-dimensional representation

In the prior figure, it is obtained that the cycle of money is in a negative orientation as it was shown in Fig. 1. Thence, there are mixed savings proportional to the growth of the cycle of money, which tends to be minimized. Therefore, follows an analysis of the sustainability of the model, using the Q.E. method on its econometric approach:

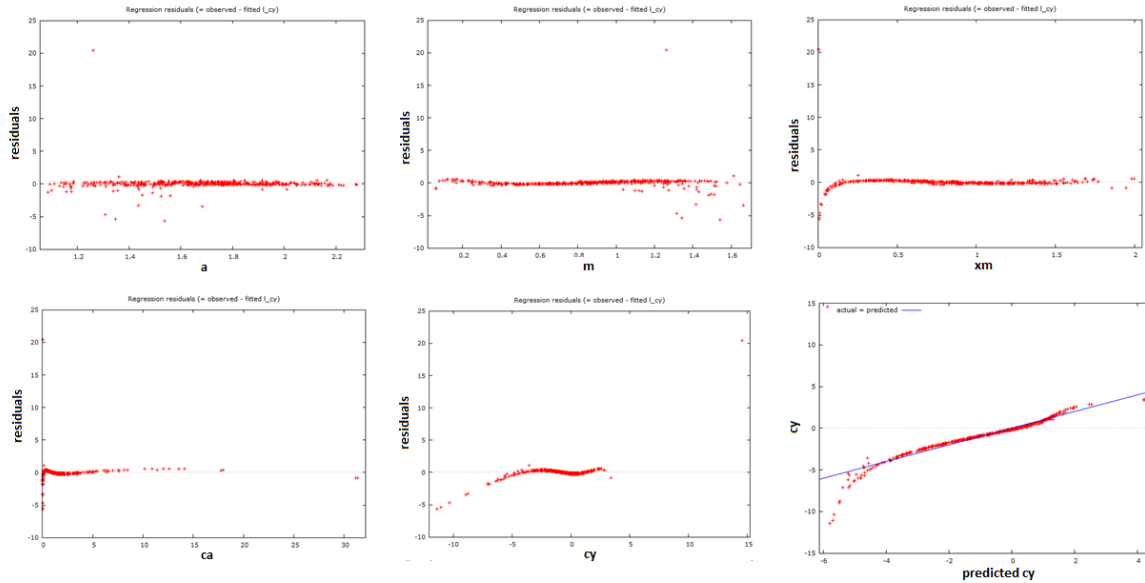


Figure 3. Econometric analysis

From the econometric analysis of the model, it is concluded that it is sustainable, as in all cases there is no diversion between the predicted values with the existing one. Thence concluded that the model is stable.

4. Conclusion

In this paper, is determined that mixed savings, in general, serve the economy, as the economic dynamic of this economy is very low, because the mixed savings are decreased. Therefore, the consumption and investments in this economy are at a lower level. If the velocity of financial liquidity is lower than the velocity of escaping savings, then the cycle of money is growing, proportionally with the growth of mixed savings.

Acknowledgements

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The author declares no competing interests.

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