

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:

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

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

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

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

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

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

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

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

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:

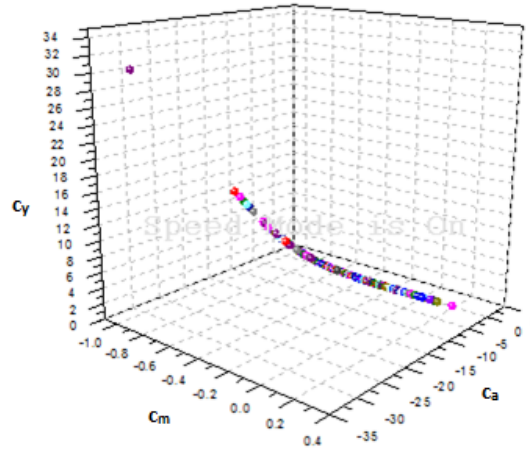


Figure 1. Cycle of money with minimum mixed savings in three-dimension representation

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:

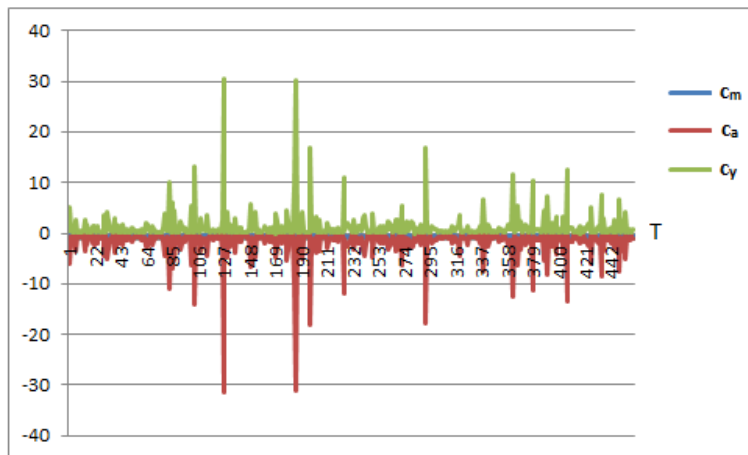


Figure 2. Cycle of money with the minimum mixed savings in a three-dimensional representation

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:

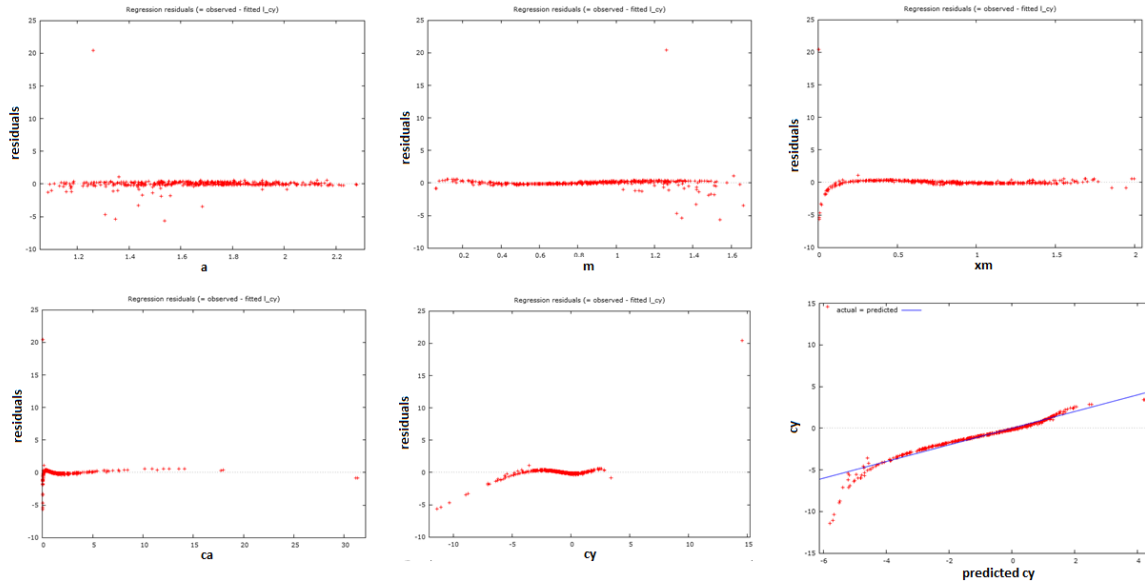


Figure 3. Econometric analysis

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.

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References

- Baker, S. D., Hollifield, B., & Osambela, E. (2020). Preventing controversial catastrophes. *Review of Asset Pricing Studies*, 10(1). <https://doi.org/10.1093/RAPSTU/RAZ001>
- Berg, A., Markey-Towler, B., & Novak, M. (2020). Blockchains: Less government, more market. *Journal of Private Enterprise*, 35(2). <https://doi.org/10.2139/ssrn.3301714>
- Burstein, P. (2020). The determinants of public policy: What matters and how much. *Policy Studies*

- Journal*, 48(1). <https://doi.org/10.1111/psj.12243>
- Carattini, S., Carvalho, M., & Fankhauser, S. (2018). Overcoming public resistance to carbon taxes. In *Wiley Interdisciplinary Reviews: Climate Change* (Vol. 9, Issue 5). <https://doi.org/10.1002/wcc.531>
- Carfora, A., Pansini, R. V., & Scandurra, G. (2021). The role of environmental taxes and public policies in supporting RES investments in EU countries: Barriers and mimicking effects. *Energy Policy*, 149. <https://doi.org/10.1016/j.enpol.2020.112044>
- Cascajo, R., Diaz Olvera, L., Monzon, A., Plat, D., & Ray, J. B. (2018). Impacts of the economic crisis on household transport expenditure and public transport policy: Evidence from the Spanish case. *Transport Policy*, 65. <https://doi.org/10.1016/j.tranpol.2017.06.001>
- Castaño, M. S., Méndez, M. T., & Galindo, M. Á. (2016). The effect of public policies on entrepreneurial activity and economic growth. *Journal of Business Research*, 69(11). <https://doi.org/10.1016/j.jbusres.2016.04.125>
- Castro, E., & Scartascini, C. (2019). Imperfect Attention in public policy: A field experiment during a tax amnesty in Argentina. *IDB Discussion Paper*, April.
- Challoumis, C. (2019a). The R.B.Q. (Rational, Behavioral and Quantified) model. *Ekonomika*, 98(1). <https://doi.org/10.15388/ekon.2019.1.1>
- Challoumis, C. (2019b). Transfer Pricing Methods for Services and the Policy of Fixed Length Principle. *Economics and Business*, 33(1), 222-232. <https://doi.org/https://doi.org/10.2478/eb-2019-0016>
- Challoumis, C. (2020). Impact factor of capital to the economy and tax system. *Complex System Research Centre*, 2020, 195-200. https://www.researchgate.net/publication/350385990_Impact_Factor_of_Capital_to_the_Economy_and_Tax_System.
- Challoumis, C. (2021a). Index of the cycle of money – The case of Belarus. *Economy and Banks*, 2.
- Challoumis, C. (2021b). Index of the cycle of money – The case of Greece. *IJBESAR (International Journal of Business and Economic Sciences Applied Research)*, 14(2), 58-67.
- Challoumis, C. (2021c). Index of the cycle of money – The case of Latvia. *Economics and Culture*, 17(2), 5-12. <https://doi.org/10.2478/jec-2020-0015>
- Challoumis, C. (2021d). Index of the cycle of money – The case of Montenegro. *Montenegrin Journal for Social Sciences*, 5(1-2), 41-57.
- Challoumis, C. (2021e). Index of the cycle of money – The case of Serbia. *Open Journal for Research in Economics (OJRE)*, 4(1). <https://doi.org/10.32591/coas.ojre.0401.01001c>
- Challoumis, C. (2021f). Index of the cycle of money – The case of Slovakia. *STUDIA COMMERCIAL IABRATISLAVENSIA Ekonomická Univerzita v Bratislave*, 14(49), 176-188.
- Challoumis, C. (2021g). Index of the cycle of money – The case of Thailand. *Chiang Mai University Journal of Economics*, 25(2), 1-14. <https://sooi.tci-thaijo.org/index.php/CMJE/article/view/247774/169340>
- Challoumis, C. (2021h). Index of the cycle of money – The case of Ukraine. *Actual Problems of Economics*, 243(9), 102-111. <https://doi.org/10.32752/1993-6788-2021-1-243-244-102-111>
- Challoumis, C. (2022a). Index of the cycle of money – The case of Moldova. *Eastern European Journal of Regional Economics*, 8(1), 77-89.
- Challoumis, C. (2022b). Index of the cycle of money – The case of Poland. *Research Papers in Economics and Finance*, 6(1), 72-86. <https://journals.ue.poznan.pl/REF/article/view/126/83>.
- Challoumis, C. (2023a). Index of the cycle of money: The case of Costa Rica. *Sapienza*, 4(3), 1-11. <https://journals.sapienzaeditorial.com/index.php/SIJIS>.
- Challoumis, C. (2023b). Index of the cycle of money – The case of Canada. *Journal of Entrepreneurship*,

- Business and Economics*, 11(1), 102-133.
<http://scientificia.com/index.php/JEBE/article/view/203>.
- Challoumis, C. (2023c). Index of the cycle of money – The case of England. *British Journal of Humanities and Social Sciences*, 26(1), 68-77.
- Challoumis, C. (2023d). The velocities of maximum escaped savings with than of financial liquidity to the case of mixed savings. *International Journal on Economics, Finance and Sustainable Development*, 5(6), 124-133.
- Challoumis, C. (2023e). Utility of cycle of money with and without the escaping savings. *International Journal of Business Diplomacy and Economy*, 2(6), 92-101.
- Cruz-Castro, L., & Sanz-Menéndez, L. (2016). The effects of the economic crisis on public research: Spanish budgetary policies and research organizations. *Technological Forecasting and Social Change*, 113. <https://doi.org/10.1016/j.techfore.2015.08.001>
- De Araujo, V. A., Vasconcelos, J. S., Morales, E. A. M., Savi, A. F., Hindman, D. P., O'Brien, M. J., Negrão, J. H. J. O., Christoforo, A. L., Lahr, F. A. R., Cortez-Barbosa, J., Gava, M., & Garcia, J. N. (2020). Difficulties of wooden housing production sector in Brazil. *Wood Material Science and Engineering*, 15(2). <https://doi.org/10.1080/17480272.2018.1484513>
- Engström, G., Gars, J., Jaakkola, N., Lindahl, T., Spiro, D., & van Benthem, A. A. (2020). What policies address both the coronavirus crisis and the climate crisis? *Environmental and Resource Economics*, 76(4). <https://doi.org/10.1007/s10640-020-00451-y>
- Fernandez, M. A., & Raine, K. D. (2019). Insights on the influence of sugar taxes on obesity prevention efforts. In *Current Nutrition Reports* (Vol. 8, Issue 4). <https://doi.org/10.1007/s13668-019-00282-4>
- Gangl, K., & Torgler, B. (2020). How to achieve tax compliance by the wealthy: A review of the literature and agenda for policy. *Social Issues and Policy Review*, 14(1). <https://doi.org/10.1111/sipr.12065>
- Gong, B., Zhang, S., Yuan, L., & Chen, K. Z. (2020). A balance act: Minimizing economic loss while controlling novel coronavirus pneumonia. *Journal of Chinese Governance*, 5(2). <https://doi.org/10.1080/23812346.2020.1741940>
- Hagenaars, L. L., Jeurissen, P. P. T., & Klazinga, N. S. (2017). The taxation of unhealthy energy-dense foods (EDFs) and sugar-sweetened beverages (SSBs): An overview of patterns observed in the policy content and policy context of 13 case studies. In *Health Policy* (Vol. 121, Issue 8). <https://doi.org/10.1016/j.healthpol.2017.06.011>
- Haigh, Y. (2020). Increasing complexities: Teaching public policy in the age of discontent. *Teaching Public Administration*, 38(1). <https://doi.org/10.1177/0144739419879483>
- Jeon, J., Kim, S., & Kwon, S. M. (2020). The effects of urban containment policies on public health. *International Journal of Environmental Research and Public Health*, 17(9). <https://doi.org/10.3390/ijerph17093275>
- Kominers, S. D., Teytelboym, A., & Crawford, V. P. (2017). An invitation to market design. *Oxford Review of Economic Policy*, 33(4). <https://doi.org/10.1093/oxrep/grx063>
- Levi, S. (2021). Why hate carbon taxes? Machine learning evidence on the roles of personal responsibility, trust, revenue recycling, and other factors across 23 European countries. *Energy Research and Social Science*, 73. <https://doi.org/10.1016/j.erss.2020.101883>
- Maier, E. (2012). Smart Mobility – Encouraging sustainable mobility behaviour by designing and implementing policies with citizen involvement. *JeDEM - EJournal of EDemocracy and Open Government*, 4(1). <https://doi.org/10.29379/jedem.v4i1.110>
- Olcina, G., Tur, E. M., & Escriche, L. (2020). Cultural transmission and persistence of entrepreneurship. *Small Business Economics*, 54(1). <https://doi.org/10.1007/s11187-018-0089-2>
- Paes-Sousa, R., De Andrade Schramm, J. M., & Pereira Mendes, L. V. (2019). Fiscal austerity and the health

- sector: The cost of adjustments. *Ciencia e Saude Coletiva*, 24(12). <https://doi.org/10.1590/1413-812320182412.23232019>
- Peres, M. F. P., Oliveira, A. B., Sarmiento, E. M., Rocha-Filho, P. S., Peixoto, P. M., Kowacs, F., Goulart, A. C., & Benseñor, I. M. (2020). Public policies in headache disorders: Needs and possibilities. *Arquivos de Neuro-Psiquiatria*, 78(1). <https://doi.org/10.1590/0004-282X20190144>
- Rasmussen, K., & Callan, D. (2016). Schools of public policy and executive education: An opportunity missed? *Policy and Society*, 35(4). <https://doi.org/10.1016/j.polsoc.2016.12.002>
- Siegmeier, J., Mattauch, L., Franks, M., Klenert, D., Schultes, A., & Edenhofer, O. (2018). The fiscal benefits of stringent climate change mitigation: an overview. *Climate Policy*, 18(3). <https://doi.org/10.1080/14693062.2017.1400943>
- Syukur, M. (2020). Insentif Pajak terhadap Sumbangan Covid-19 dari Perspektif Relasi Hukum Pajak Indonesia dengan Hak Asasi Manusia. *Jurnal Suara Hukum*, 2(2). <https://doi.org/10.26740/jsh.v2n2.p184-214>
- Torres Salcido, G., del Roble Pensado Leglise, M., & Smolski, A. (2015). Food distribution's socio-economic relationships and public policy: Mexico City's municipal public markets. *Development in Practice*, 25(3). <https://doi.org/10.1080/09614524.2015.1016481>
- Urwannachotima, N., Hanvoravongchai, P., Ansah, J. P., Prasertsom, P., & Koh, V. R. Y. (2020). Impact of sugar-sweetened beverage tax on dental caries: A simulation analysis. *BMC Oral Health*, 20(1). <https://doi.org/10.1186/s12903-020-1061-5>
- Van de Vijver, A., Cassimon, D., & Engelen, P. J. (2020). A real option approach to sustainable corporate tax behavior. *Sustainability (Switzerland)*, 12(13). <https://doi.org/10.3390/su12135406>
- Παλακωνσταντίνου, Α., Καναββάς, Λ., & Ντόκας, Ι. (2013). Οικονομία & μικρές επιχειρήσεις [Economy & small business]. In *Ινστιτούτο μικρών επιχειρήσεων*.

