The saving rate fluctuations in Cyprus and the impact on income inequality dynamics

November, 2017

Abstract

Savings and income inequality have an ambiguous correlation as identified in the literature. However, recent empirical analyses have found an impact on income distribution that adversely affects other macroeconomic variables over insufficient financing of investment spending. The latter may lead to slower growth causing significant economic adjustments.

During 2013, Cyprus was hit by the financial turbulence, vastly caused by the bail in on deposits above €100.000 and in conjunction with public finances challenges have led to a substantial downturn on savings, causing uneven income distribution that mostly affected the middle and the lower income deciles. Empirical data suggest that the correlation of savings with income inequality turns negative if the Gini coefficient exceeds 30% leading to increasing income inequality. Moreover, income inequality increases (reduces) saving, when credit availability is insufficient (sufficient).

The endogenous growth theory is visited to identify the correlation between the New Keynesian growth theories with the saving rate extended to income redistribution as a long-run remedy to restrict income inequality.

Cyprus has been a typical example where a very adverse financial shock of a very specific nature, induced by a preceding housing bubble led to an extremely high number of non-performing loans that distorted the financial sector instantly and substantially. This has led many households to nullify savings and experience financial uncertainty. This process, expanded the financial and public finances challenges causing a simultaneous financial and public finances crisis.

Keywords: D12, D14, D33, E21, E51

Contents

1. INTRODUCTION

The scope of the essay is to exhibit that income inequality could discourage savings during a financial crisis and thus adversely impact on a series of macroeconomic variables such as the savings rate, consumption, investment and potential growth and may even damage social cohesion through generating a more uneven income distribution. In such a case, the middle to lower income groups are adversely affected due to lower financial means (labour income and access to credit) in their effort to sustain their pre-crisis standards of living.

Furthermore, it is worthwhile noting that the amount of total credit seems to corroborate the proposition that it has a positive correlation with the gross saving rate. Thus, it may impact potential growth via lower financing of future investment. All these might have an adverse social impact in terms of damaging social cohesion and future prosperity via lower growth dynamics and increasing income inequality.

Moreover, recent study by Bofinger[1] et al (2016) identified that household savings and inequality are better described by a hump-shaped relationship instead of a linear one. The explanation they deduce is that their relation is positive at low levels of inequality and becomes negative in high levels of inequality and more precisely when Gini coefficient exceeds a pivotal value of around 30%.

For Cyprus' case the rationale of the above analysis is that prior to the financial crisis the massive expansion of corporate and housing Non-Performing Loans (NPL's) provided by the domestic banking sector, have inevitably led to the embarked financial crisis.

The essay illustrates one method to escape this, in the long-run, if the government pursue a different growth strategy that is similar to models described in endogenous growth theory. The endogenous growth models developed primarily by Barro, Lucas and Romer[2] could lead to some economic policy inferences and policy measures for the Cyprus economy.

A repaired financial system capable of restoring stability with more efficient reallocation of economic resources could provide in the medium term, the necessary policy mix for profitable projects under a sound financial system that could provide the needed financing means. This can also lead to significant efficiency gains through expanding production possibilities. Furthermore, it is noteworthy that the efficient cooperation of the government with the private sector to enhance investment opportunities in R&D and innovation could help to deviate from the traditional labour intensive growth model. In the

[1] P. Bofinger et. al. "Income distribution and income inequality", CEPR Policy Portal, 2016.

[2] Barro 1990, Lucas 1988, Romer 1990.

case of Cyprus and despite its small size, this approach could support new business initiatives and innovative ideas by producing and exporting R&D. This could be well combined with Cyprus traditional[3] comparative advantages to create new jobs in a flexible labour market set up and raise economic growth at sustainable levels for the next generations.

Section 2 of the essay attempts to analyze the relationship between the aggregate saving rates with income inequality dynamics. In Section 3 the endogenous growth theory is presented as a means to serve as a growth enhancing tool. In Section 4 some policy priorities and fiscal sustainability policy measures are suggested. Section 5 demonstrates some concluding remarks.

2. SAVINGS & INEQUALITY DYNAMICS

Underneath, Figures 1 and 2 illustrate that the reduction of gross savings rate led to a redistribution of income in association with the Gini coefficient and the s90/s10 upward fluctuation, in the critical period.

At the same time, the saving rate was decelerating from 2013 until 2015, which validates that one of the most serious impact of negative savings could be income redistribution that began taking place one year earlier in 2012.

Figure 1 validates the proposition that when the marginal[4] Gini coefficient exceeds a pivotal value of around 30%, the impact on household-sector's gross saving rate becomes negative. In other words, it seems that under a financial shock, income inequality is likely to rise and that could cause a reduction in household savings influencing negatively the aggregate saving rate (P. Bofinger et.al. 2016).

In addition, Figure 1 exhibits that amid the financial crisis, which was at its peak in 2013-2014 the saving curve movement denoted a large downswing with a parallel upswing of Gini co-efficient. The above correlation identifies one reason of income inequality exacerbation during the financial crisis years. Figure 1 illustrates that the correlation coefficient between the saving rate with Gini coefficient is negative (-0.95) indicating the relationship between the two. The time series for estimating the correlation coefficient is from 2006 to 2015.

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[3] The Cyprus traditional growth model was based upon education driven labour supply tailored with certain labour intensive services (business, financial, shipping) and including some natural but not unique resources, such as, sea and sun characterized by high volatility and uncertain sustainability.

[4] The marginal Gini coefficient equals the additional inequality in Gini coefficient terms with respect to the corresponding change of the aggregate saving rate.

Amid the financial turbulence, Figure 2 explicitly depicts that the downswing of saving rate especially in 2013-2015 had caused a parallel inequitable income redistribution as revealed by s90/s10. Another critical reason of the saving's decline is simulated by the massive withdrawal and use of their cash deposits by the lower income groups in their effort to mounting their consumption spending and thus, their standard of living.

Figure 1: Gross saving rate & income inequality dynamics

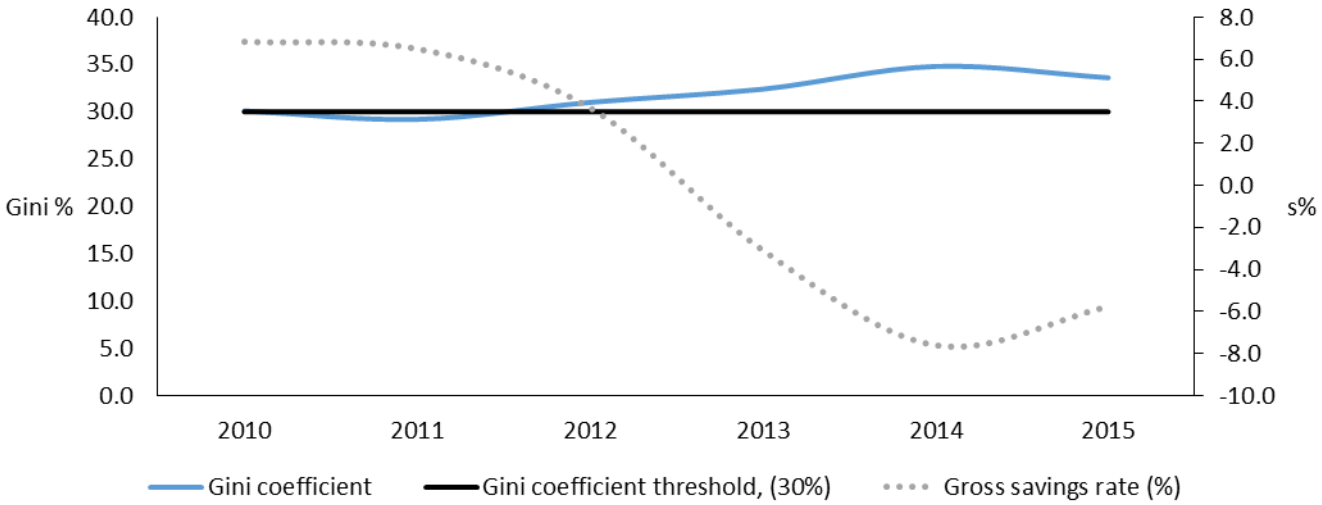


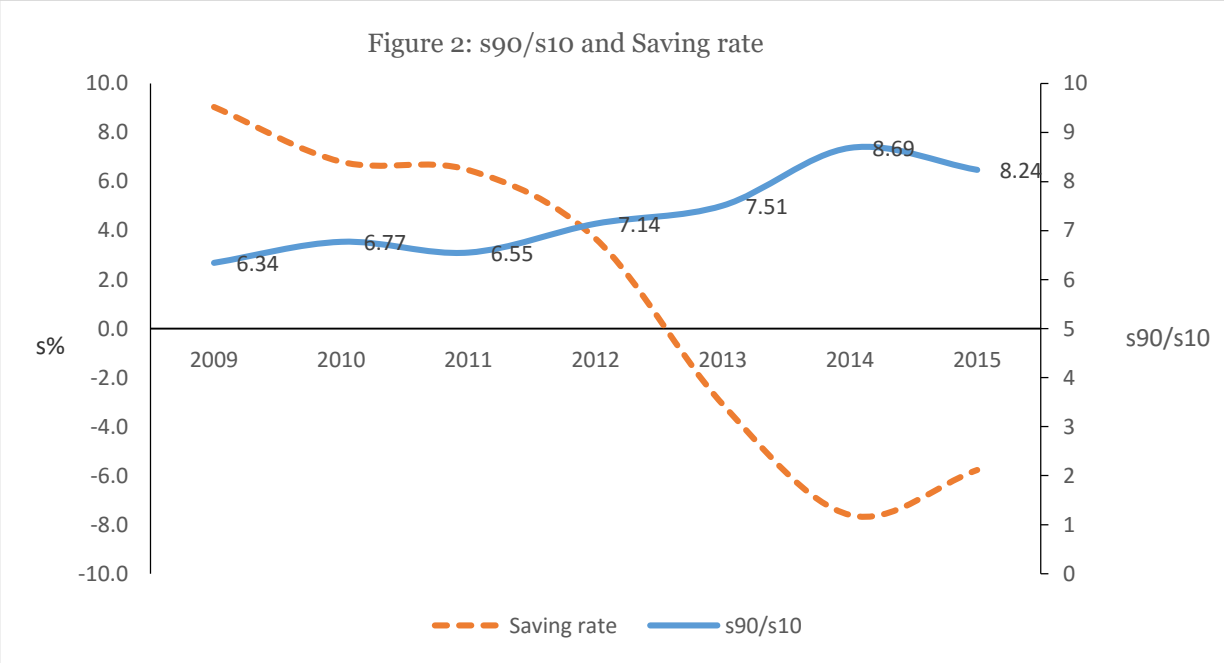
Figure 2 corroborates the same reasoning by plotting gross saving rate with the s90/s10 indicator.

It is worthwhile noting that based upon the results of the EU SILC 2016 survey carried out by the Statistical Service, with 2015 reference year, the income inequality indicators have been denoting an improvement; thus, the Gini coefficient from 33.6% in 2015 has fallen to 32.1% in 2016 while the s80/s20 indicator from 5.2 in 2015 was reduced to 4.8 and the s90/s10 was also reduced from 8.2 to 7.6 in 2016 indicating a slow and gradual return to better social cohesion conditions. The relative speed of this tendency could continue as long as growth is maintained positive.

During the financial crisis' peak, the s90/s10[5] increased from 7.1 to 8.7 indicating a percentage increase by 23% and in 2013-2015 the saving rate shrank cumulatively by 16.6%.

Moreover, the correlation coefficient is estimated between s90/s10 with the saving rate. The result pinpoints that the correlation is negative to -0.93 exhibiting that the relationship of the two is related negatively validating in some respect the inverse correlation of total credit and saving rate of Cyprus during that period.

[5] The s90/s10 ratio is calculated as the ratio of the mean income received by the 10% of the population with the highest income to that received by the 10% of the population with the lowest income.



In Figure 3 below, the value of total credit comprising of total deposits and loans in the domestic economy is plotted with respect to Gini coefficient suggesting an implicit correlation between them predominantly in 2013. Apparently, it seems that as long as total credit growth was steady in 2010-2012 income inequality reflected in Gini indicator had a tendency to fluctuate around 30% demonstrating a relatively low impact on inequality dynamics. Thereafter, the significant fall of total credit from 2012 onwards due to the bail in consequences led to a parallel upward trend of the Gini coefficient that was sustained until 2014 when credit returned to steady rates.

Figure 3: Total credit & Gini coeficient

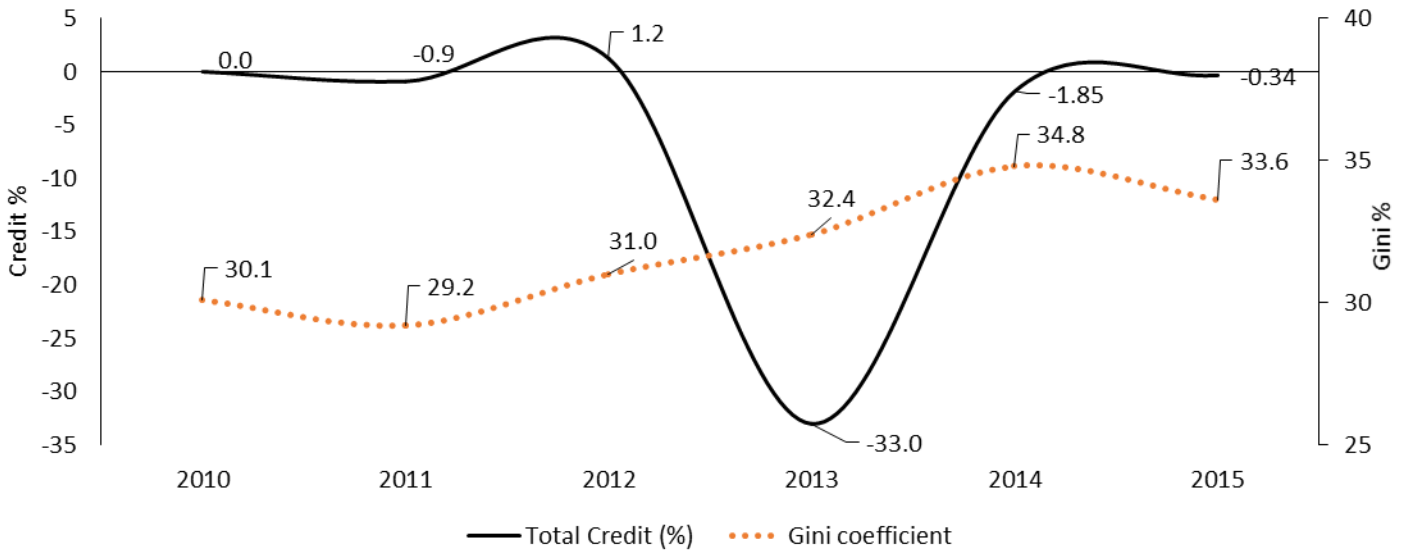


Figure 4 depicts that gross savings of the Cyprus' household sector exhibit a substantial reduction in 2013-2015 amounting to nearly €2 billion as a result of the significant withdrawal of households' deposits and the liquidation of pension and insurance schemes reserves.

Figure 4: Total gross household savings, 2010-2015

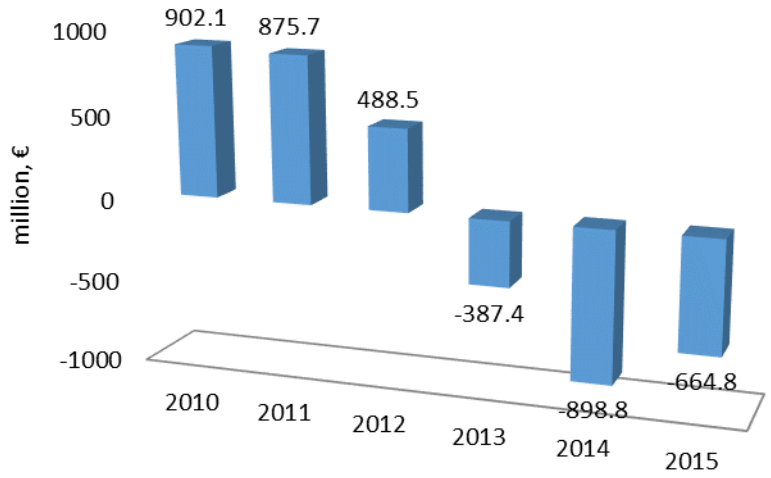


Figure 5 further down depicts that the high number of NPL's has cancelled out available credit in the critical period, which could have been lent to physical and legal persons. As a result, the rise in NPLs reduced banks' capital adequacy ratio, which is necessary to keep it at a specific level determined by the

ECB and the Central Bank of Cyprus[6] (CBC) policies. The above mentioned process reduced their turnover and profit margins significantly and put overall the Cypriot economy under severe financial risks.

This process has unavoidably contained economic activity resulting an increasing unemployment rate and other unfavorable effects on real economy. These effects are associated with rising social divergence triggered by the upswing of income inequality. As shown in Figure 5, in 2016, more than 40% of the available credit had been reflecting NPL's most of which were household loans.

After the risk profile of domestic commercial banks was raised following the corrective measures taken in 2013-2015, the above ECB's policy target is the most difficult task they should attain to avoid any future downscale of their performance.

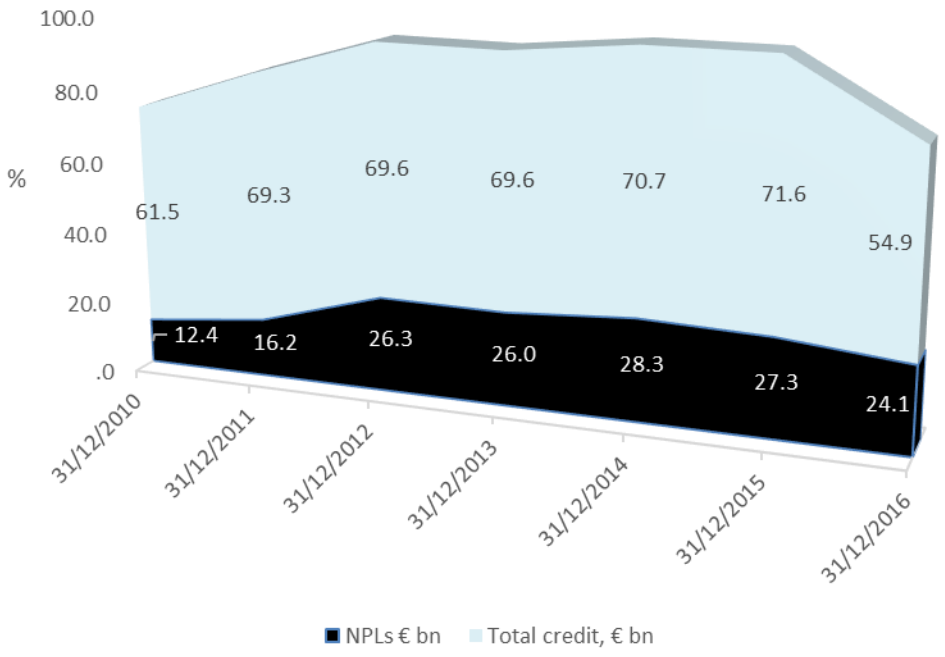
The NPLs' appearance in Cyprus validates the theory that a financial crisis is likely to cause rising inequality and regressive distributional effects. Non-Performing Loans, as per the definition in force before 1 July 2013, which excluded loans fully covered by tangible collateral. As per above, adjusted to include those loans fully covered by tangible collateral but which fulfil all remaining criteria to be classified as NPLs (primarily, being those having arrears exceeding 3 months).

Both figures suggest that after the 2013 bail in on deposits above €100.000, it was reasonable enough savings to decline extending the pitfalls on the Cyprus economy by 2013 onwards replicated in social incoherence.

Thomas Y. et al of the Central Bank of Luxembourg, BCL, in their paper "Household wealth in the euro area, the importance of intergenerational transfers, Homeownership and House price dynamics" tried to uncover some of the main factors driving some wealth differences amongst euro area countries. They focused on three main factors: 1) homeownership, 2) property price dynamics and 3) intergenerational transfers.

[6] Source: Central Bank of Cyprus, "Household and Non-Financial Corporations Indebtedness Report", April 2017

Figure 5 : Total credit & NPL's



In the household wealth literature, these factors are recurring found to be of importance for the wealth accumulation process, and differences across countries therein are therefore expected to contribute to explaining the observed wealth differences across euro area countries. For example, homeownership, which is the most important household asset, varies greatly in the euro area (44%-90%). Similarly, past house price dynamics in the last 20+ years differ substantially across euro area countries. In some countries, notably Germany, house prices have increased very modestly in the last twenty years (until 2010), whereas in other countries house price developments were very dynamic. In Cyprus, house prices were unsustainably raised reflecting the huge number of NPLs. Total credit before the financial crisis' peak in 2013-2014 revealed that in Cyprus, non-performing loans' upsurge distorted significantly the former, through paralyzing profitable and sound investments.

Zhang T et al of IMF (2017) have shown that high levels of inequality tend to reduce the pace and durability of growth and this is why policy makers should not be afraid to adopt measures that ensure shared prosperity, including ones that redistribute wealth.

3. ENDOGENOUS GROWTH TO SERVE AS GROWTH ENHANCING TOOL

Endogenous growth, apart from the population and capital rise, entails the significance of human capital reflected to high education and innovative technology (Barro 1990, Lucas 1988 and Romer 1990). Education intensive labour rather than just more labour is not only transposed to higher GDP employment but it can also lead to increasing returns to scale. This could provide a critical comparative advantage to enterprises producing at a lower average cost.

Recalling the disposable income equation where Yd, C and S stand for disposable income, consumption spending and savings respectively.

$Yd=C+S$

=>

$S=Yd-C$

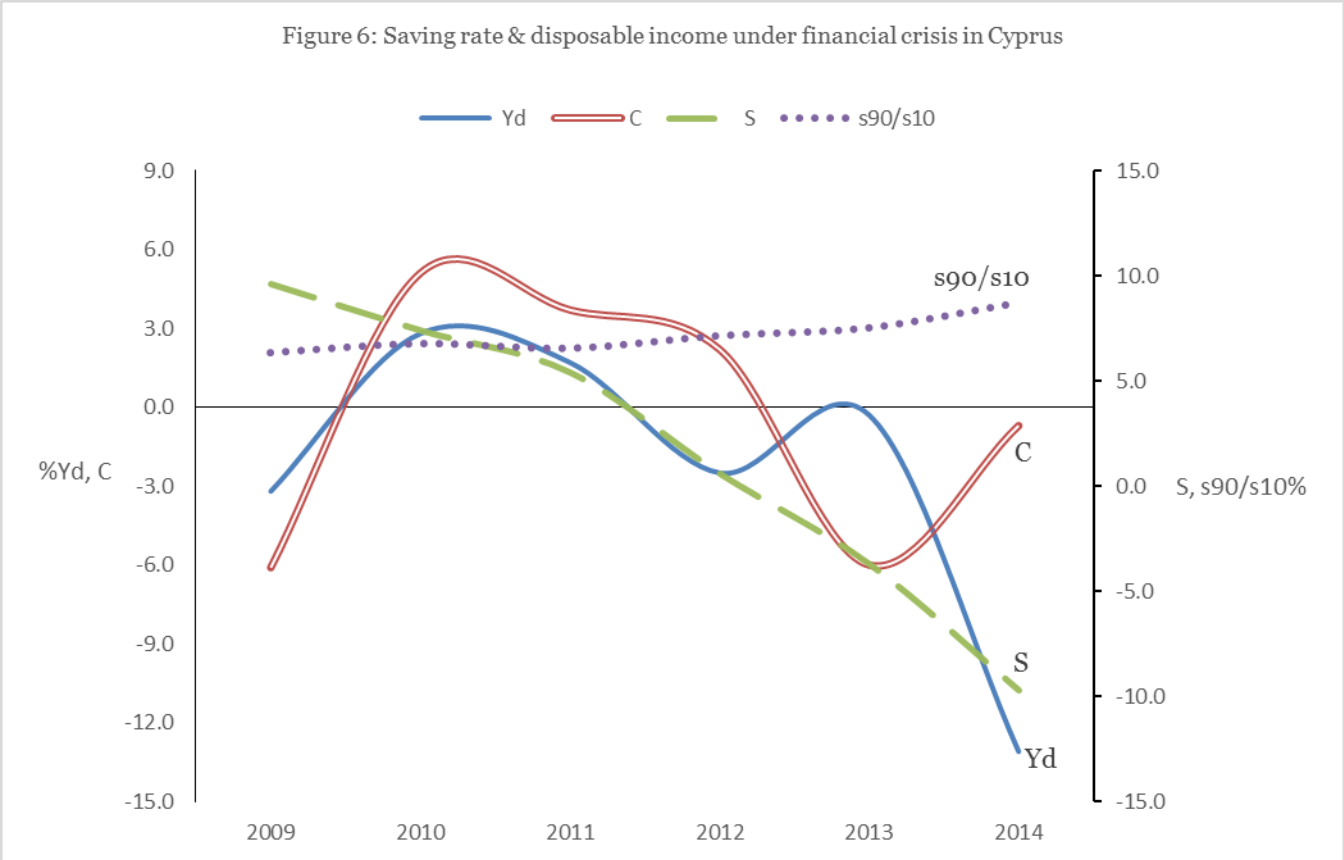
and taking the first derivative of the above equation then $\Delta S = \Delta Yd-\Delta C$.

Dividing all terms with ΔYd then $\Delta S/\Delta Yd= 1-\Delta C/\Delta Yd$
=>

MPS+MPC=1 that refers to the identity that the Marginal Propensity to Save (MPS) plus the Marginal propensity to Consume (MPC) equals unity meaning that part of disposable income is consumed and/or saved.

In Figure 6 underneath, after smoothing the relevant curves, the disposable income equation is illustrated for Cyprus in diagrammatical form for the period 2009-2014. The fall in savings in the critical period (2012-2014) induced a major downswing in the money market that was transmitted in the goods market causing a pronounced reduction of households' disposable income. The failure of the money market is attributed to the existence of a large number of non-performing loans, the feeling of mistrust among financial agents and depositors, the failure of the CBC to exercise its supervisory role efficiently and consequently, to the relevant downfall of savings that led to intense macroeconomic adjustments.

The downswing of savings had readjusted also disposable income and consumption rates as depicted in figure 6 below, raising at the same time, the opportunity cost of making new loans.



It is obvious that the disposable income had exhibited a downward path in 2012-2014 (source: Cystat). The same trend is denoted to savings while consumption has also declined in the same period. The nature of the financial crisis in Cyprus was such that inevitably could have an adverse impact on income distribution and thus, on income equality. As it is exhibited, the s90/s10 indicator has been deteriorating since 2011 onwards justifying that lower savings associated with a financial influx can lead to a more uneven income redistribution.

In the case of Cyprus, the reduction of disposable income was associated with a reduction of both consumption spending and savings during and after the financial crisis. The reduction of savings had a major negative distributive impact on those who were at the bottom 10%, as depicted above by the upward variation of the s90/s10 curve in 2011-2014.
Nonetheless, it should be stressed that income inequality indicators, take more time to decline after the GDP rebounds. These indicators are time lagged second order[7] indicators and their real effects are only visible 1-2 years later.

Endogenous growth, apart from the population and capital rise, entails the connotation of human

[7] The second order indicators are estimated by the second derivative of the function.

capital reflected to high education and innovative technology (Barro 1990, Lucas 1988 and Romer 1990). Education intensive labour rather than just more labour is not only transposed to higher GDP employment but it can also lead to increasing returns to scale. This could provide a critical comparative advantage to enterprises producing at a lower average cost.

The Lucas[8] Model

It makes a distinction between the internal effects of human capital where the individual worker undergoing training becomes more productive and external effects which spillover and increase the productivity of capital and of other workers in the economy. It is investment in human capital rather than physical capital that have spillover effects that increase the level of technology. Thus, the output for firm i takes the form:

$Y_i = A(K_i).(H_i).H^e$ (1)

where, A is the technical coefficient, K_i and H_i are the inputs of physical and human capital used by firms to produce goods Y_i. The variable H is the economy's average level of human capital. The parameter e represents the strength of the external effects from human capital to each firm's productivity.

In the Lucas model, each firm faces constant returns to scale, while there are increasing returns for the whole economy. Further, learning by doing or on-the-job training and spillover effects involve human capital.

2.4 Romer's Model of Technological Change

Romer's model of Endogenous Technical Change[9] of 1990 identifies a research sector specializing in the production of ideas. This sector invokes human capital along with the existing stock of knowledge to produce ideas or new knowledge. Ideas are more important than natural resources.

Therefore, ideas are essential for the growth of the economy. These ideas relate to improved designs to produce durable goods for final production.

In the Romer model, new knowledge enters the production process in three ways. First, a new design is used in the intermediate goods sector to produce a new intermediate input. Second, in the final sector, labour, human capital and available producer durables produce the final product. Third, and a

[8] R. Lucas "On the dynamics of economic development" (1988) and P. Romer "Growth based on increasing returns due to specialization" (1987).

new design increases the total stock of knowledge which increases the productivity of human capital employed in the research sector.

The Romer model can be explained in terms of the following technological production function:

$\Delta A = F(K_A, H_A, A)$ (2)

where ΔA is the increasing technology, K_A is the amount of capital invested in producing the new design (or technology), H_A is the amount of human capital (labour) employed in research and development of the new design, A is the existing technology of designs, and F is the production function for technology.

The production function shows that technology is endogenous when more human capital is employed for research and development of new designs, then technology increases by a larger amount, i.e., A is greater. If more capital is invested in research laboratories and equipment to invent the new design, then technology also increases by a larger amount i.e., ΔA is more. Further, the existing technology, A, also leads to the production of new technology, ΔA.

A sort of endogenous growth model is the one reduced to the following relationship and described below that the capital/output ratio $'\kappa/\kappa$ is positively related to the saving rate s and to the existing technology A, $'\kappa/\kappa = s(1-\tau)A-(\delta+n)$ (3), (C. Bean, "Government Policy and Economic Growth", 1994).

Let incorporate two sorts of capital, H the human capital and HL the human capital of labour. If an efficiency parameter e is added to represent the education sector, then the associated growth rate of equation 3 is reduced to $\gamma^* = e\tau f\,[s(1-\tau)/e\tau]-\delta$ (4) illustrating that the growth rate γ^* under this scenario is positively related to the education efficiency factor, the share of government spending to output and the saving rate while is inversely related to the rate of depreciation on capital investment (δ).

The endogenous growth theory could facilitate to provide specific policy proposals for Cyprus and thus, alleviate to exit the growth vicious circle the country is being trapped for years.

The development of an alternative growth model for Cyprus could reduce the financial crisis costs and ease preserve the necessary macroeconomic stability. A different growth model could entrench new products/services, reduce the overdependence on risk related financial products, shorten the seasonality effect of tourism and sustain a higher growth path with other factors like reorienting its educational system and more capital embedded with higher technology could also drive growth higher. The critical point for Cyprus' sustainable growth path is its resilience and capability to sustain economic growth high in the medium-term.

Endogenous growth theorists share that the investigation of how increasing returns to scales can prevail and return in the economy through components such as innovation, R&D and education of human capital and how to be used as the growth engine of an economy. The connotation behind these models is concerned with rising production exponentially rather than linearly reflected in increasing rather than constant returns to scales.

4. POLICY PRIOTIES & FISCAL SUSTAINABILITY

The role and significance of the economic policy is crucial in directing the economy towards a stable growth path. The economic policy, however, should avoid any unnecessary drawbacks and take all necessary policy measures to ensure sustainable growth, job creation and economic prosperity.

Moreover, what is needed is the government to decide at the highest possible level, to pursue an economic policy which would restore trustworthiness in the financial sector that is necessary to provide the necessary financing of economic growth for the years to come.

Such policy measures could, inter alia, include some of the following proposed underneath, taking into consideration macroeconomic, microeconomic and financial-structural policy interventions:

Macroeconomic policy measures:

1) Target a moderated increase of maximum 2% on the inflation rate and the potential growth rate to be at the level able to closing the output gap and maintain the structural fiscal deficit in a balanced position to avoid any inflationary or deflationary risks.

2) The government should mark and sustain primary fiscal surpluses and equip with the necessary tools in confronting with future crises to safeguarding public finances sustainability by following the criteria set by the Stability and Growth Pact tailored with the priorities of the Cyprus economy.

3) The economic policy could use part of its primary fiscal surpluses to raise social cohesion to restore cohesive conditions without causing any unnecessary fiscal deficits that could put public debt under an upward risk.

Microeconomic policy measures:

4) Invest in tailor-made human capital with a view to raise growth education and health efficiency enhancers, thereby reforming the education and health systems in line with labour market needs.

5) Provide targeted tax incentives to low income earners to offset some of the economic loss experienced due to the financial crisis.

6) Reduce the tax wedge on labour to enhance job creation and employment.

Financial policy measures:

7) The expected interest rates' gradual reduction could make the banks to provide a higher number of more efficient business loans necessary to drive growth prospects higher.

8) The commercial banks to reduce skillfully NPLs by consolidating their balance sheets and allowing for more efficient completion of their regular financial activities under a more scrutinized supervisory setup.

9) The government, the CBC and the Cyprus Securities and Exchange Commission to ensure that the financial sector could safeguard household's savings and loans from faulty and risky financial products and from commercial bank's behaviour that could endanger their future wealth.

10) The economic policy to ensure thereby its comprehensive and effective surveillance that the financial sector could remain the backbone of the Cyprus economy in providing the required and sound lending for GDP real growth in the medium term.

Structural policy reforms and measures

11) Raise the implementation of targeted and comprehensive Active Labour Market Policy Measures to facilitate job searching, reduce long term unemployment and prepare the conditions youth and tertiary graduates to enter into the labour market and seek jobs in Cyprus instead of abroad.

12) Following the same reasoning the government to set the previous action as a long run task to confront with the population ageing repercussions and especially target the age group 50+ once their needs are significant in the aftermath of the financial crisis.

13) Perform an exhausting and holistic expenditure review of the education sector commencing from the primary education and continue with the others.

14) Facilitate the cooperation of private-public sector to transfer/export knowledge in R&D technology and produce innovative ideas to achieve increasing returns to scale by opening new jobs, especially, in the medical, education and business services sector, where Cyprus maintains a comparative advantage of a highly educated human capital.

15) Exploit the positive externalities associated with the above mentioned sector and invest on health care and medical rehabilitation technology services that Cyprus can provide combined with its warm and mild climate.

16) Ensure the effective and cost containment implementation of public hospitals autonomy to raise health care efficiency and quality in association with the scheduled phase introduction of the national health insurance scheme envisaged to start on June 2019.

17) Preserve the long run sustainability of the social insurance funds and promote the second and third pillar of pensions to raise adequacy and safeguard sustainability by promoting the necessary institutional framework.

18) Right after the 2018 presidential election, the new government elect could make an attempt to reach a wide range consensus with trade unions, employers and the government in order to smoothly promote some of the above mentioned macroeconomic, microeconomic and financial-structural targets and therefore, safeguard macroeconomic stability and sustain growth and social cohesion prospects sound in the medium term.

The implementation of any such policy measure should primarily be safeguarding public finances

sustainability by not exercising additional pressure on public finances and thus, leading to any upward trend of public debt.

Nonetheless, many of the above policy measures entrench a quite high uncertainty in terms of time and efficient implementation and thus is highly susceptible to meet political economy resistance by pressure groups, trade unions and political parties that could alter their initial economic scope.

CONCLUDING REMARKS

In conclusion, the above economic policy paper has illustrated the relationship between savings with income inequality and the relationship with total credit. The explicit correlation identified for Cyprus between savings and income inequality dynamics reveals that there is a strong inverse correlation effect as measured by the correlation coefficient between the two variables. The same is true when inequality dynamics are put under the scope of total credit indicating that the inequality-savings channel depends substantially on the relevant financial conditions. **At the same time, the example of Cyprus validates the inference drawn by Bofinger et al (2016) that when the saving rate starts falling due to a financial shock, the inequality in Gini coefficient terms becomes more prominent after exceeding 30%.**

In particular, it seems that the combination of increasing inequality associated with the last financial turmoil effects brings the economic policy makers in front of major challenges and dilemmas concerning Cyprus growth model. As it is explained, by placing upfront endogenous growth models, it is revealed that Cyprus could raise its production possibilities.

As far as income inequality is concerned, due to the time lag effect concerned with socioeconomic variables, it is decisive to envisage that most of these indicators are anticipated to continue improving in the next years. This tendency is expected to be fostered by the fact that the median income is forecasted to pursue an increasing trend in 2018-2020, while the unemployment rate to pursue a declining path improving the socioeconomic indicators.

Additionally, it is found that models of the endogenous growth variety could reverse the economic pace of the Cyprus economy and drive growth higher based upon other and more dynamic factors of production reflected in education and health efficiency parameters in line with higher investment in R&D and innovative products as well as in the hydrocarbons area envisaged to produce significant returns to the domestic economy.

If this overall pace is put forward, it could enhance and trigger economic growth in the medium-term and drive the Cyprus economy towards a sustainable growth path in the forthcoming years.

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