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**Article**

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Article

# Social Security Payments and Financialization: Lessons from the Greek Case

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**Abstract:** This paper is founded on both the theoretical schemes of financialization, as a new regime of accumulation, and the shareholder value, the everyday finance, the structured finance, as well as the finance-led growth regime, whose special institutional forms concern the wage–labor nexus, the competition form, the monetary regime, the state–society relations, the insertion into the international regime, and the coherence and dynamic of the growth regime. It also aims to examine if the Greek social security system (the “system”) used financial logic in economic policy during the period of 2000q1–2021q3. It is econometrically approached through the short-run Granger causality tests but mainly the autoregressive distributed lag model in order to estimate the long-run relationships of the social contributions and benefits paid, with variables expressing the financialization either of the whole economy or particularly of one of the public sectors. So, these steady-state relationships proved statistically significant, and they are considered to be compatible with several mechanisms of the finance-led growth regime. Thus, the sustainability of the “system” should be insured by the policy makers in the economic progress and the creation of new jobs able to fund it. This article contributes to the literature by offering empirical evidence on the financialization and relevant compilation analysis.

**Keywords:** social security system; financialization paradigm; finance-led growth regime; Greek economy; ARDL; Granger causality



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## 1. Introduction

The Eurozone sovereign debt crisis in the 2010s and its consequences were extremely painful, especially for the Greek society and economy. It cannot be understood with only the observation of the 25% recorded plunge of the real gross domestic product (GDP) over the period 2008–2015. The structural changes in the society, economy, and polity there are deep and prolonged, if not permanent. As far as the Greek economy is concerned, besides the implications of the fragile Eurozone (De Grauwe 2020), it should be pointed out that some distinctive features or institutional forms (Boyer 2000) have arisen from the implementation of the three memoranda of understanding (MoU) signed by the government with the troika (International Monetary Fund (IMF), European Commission (EC) of the European Union (EU), and European Central Bank (ECB) of the Eurosystem) before 2018, namely, (1) the deregulation of the labor market from an almost fully organized regime to a typical formation of competitive wage; (2) the competition regime of the country, which was under pressure but has since been dominated under transnational forces, confirming the typical price-taker regime of a small open economy; (3) the dominant hierarchy at the international and European level and the institutional form of the monetary and financial regime, which was exaggerated and then forced the local institutions to comply to the IMF, ECB, EC, and European Stability Mechanism (ESM) regularly; (4) the state–economy nexus,

which has changed significantly due to neither the financial liberalization and relevant products innovation that have been going on since the 1990s nor the necessity to finance the twin public and trade deficits from abroad in a currency, the Euro, that is out of the central bank's control (fragile Eurozone), but mainly to one requirement, i.e., to maintain its attractiveness for international investors; (5) the integration into the European and the world economy illustrated an unprecedented intensity in the competition regime, since almost all the sectors and industries have been replaced by international value chains leading to the coherence of the productive system to be surveilled at the world and not at the domestic level anymore (Boyer 2018).

Within these dynamics, the Greek welfare system has been tackled as a luxury good with pure financial logic, which could not be sustainable, not only because of the demographics or the shadow labor market (both of which were its fundamental causes) causing a weak tax base, but mainly because of the abovementioned structural changes of the economy.

In this study, we investigated whether the long-run equilibrium of the Greek social security system (hereafter the "system") has followed the financialization paradigm (Mader et al. 2020); so, the research question is designed to be tested through three relevant research hypotheses concerning the financialization of the total economy, especially of the public sector, as well as their transmission mechanisms from the short-run to the steady-state of the system, since the mid-1990s. Our motif is quite clear: if there is a long-run or steady-state relationship between the "social contribution and benefits paid" representing the "system" and the relevant financialization's variables, then this "paradigm" could be used for policy and forecasting purposes on the welfare state.

Theoretically, the social policy cannot be designed out of the relevant growth model or regime of a country. This, in action, is chosen by the Greek policy makers to be what the EU has adopted, that is, the competition-led growth regime (Boyer 2000), as published, stylized facts of international institutions confirm (International Monetary Fund (IMF) 2022; Organization for Economic Cooperation and Progress (OECD) 2022; Bank of Greece (BoG) 2021). Its main features for most of the Organization for Economic Cooperation and Development (OECD) countries, since 1985, are: (1) Wage-labor nexus: external market flexibility and competitive wage. (2) Form of competition: privatization, deregulation, and globalization. (3) Monetary regime: Stability of monetary policy. (4) State/society relations: proactive and market-enhancing state. (5) Insertion into the international regime: wider opening to international trade, investment, and finance. (6) Coherence and dynamic of the growth regime: risk of overcapacity and deflation. However, as the Southeast Asian crises of 1997 have shown, these strategies are limited by the institutional conditions of the finance-led growth regime, i.e., the globalized financial regime, the shareholder value as a new form of competition and governance mode, and the highly reactive wage-labor nexus (Boyer 2000). In a broader sense, this is the financialization paradigm, that is, "the rise of financial markets not for the facilitation of other markets but for the trade in money, credit, securities, etc." (Aalbers 2008), which reached an impasse in GFC-2008. The Eurozone sovereign debt crisis that started in Greece in 2009 has not only risen its architectural deficiencies, mainly originated from the fragility of its incomplete monetary union (De Grauwe 2020), but also underlined the nonsustainability of the competition-led growth regime (see, for instance, so many "zombie" firms, both nonfinancial and financial) as the financialization scholarship supports, especially since the GFC-2008.

Thus, the scholarship on financialization (Stockhammer 2004; Krippner 2005; Epstein 2005) rose sharply after the great and global financial crisis of 2007–2008 (GFC-2008), which, as Mader et al. (2020), among others, wrote, "served as a wake-up call of the destructive scale and power of financial systems". The concept of financialization is much broader than the finance-led growth regime (Boyer 2000), and its scholars recognize it as "one tendency among tendencies" in the transformation of the "market economy" or capitalism (Davis and Walsh 2017). A widely employed definition of the financialization offered by Epstein (2005) is "the increasing roles of financial motives, financial markets, financial actors and financial

*institutions, in the operation of the domestic and international economies*". The main approaches of the financialization paradigm have been recorded to be: (1) the emergence of a new regime of accumulation, (2) the dominance of the shareholder value, (3) the financialization of the everyday life, and (4) the structured finance and cultural, as well as calculative, transformation of credit rating agencies (CRAs) (van der Zwan 2014; Besedovsky 2018; Mader et al. 2020). The most influential for the paradigm has been considered to be the shareholder value, which has shaped corporate governance theory (Lazonick and O'Sullivan 2000), mostly following the critical accounting approach of the Manchester School (Froud et al. 2000).

This paper focuses on the finance-led growth regime (Boyer 2000) as the direct transformation of the aforementioned competitive or even the debt-driven demand one, while it is considered more appropriate for a small open economy such as Greece. It is presented more detailed in the following section. The cornerstone of the model is the "shareholder value" as a new form of competition and governance mode of the firms, while it is originated from the pure logic of the global "financial system". The latter, occupying the core position in the feedback mechanisms (named in Boyer 2000, Figure 3 from A to G) that concern all three markets and institutional sectors of an open economy, is characterized by several articulated elements. Among them, the primary is the "management of firms for shareholders", which constantly requires a raised rate of returns, fed by productive investments and facilitated from the labor contracts' flexibility. The patrimonial equity-based household behavior along with the privatization of elements of social security are two additional elements triggered from the financial system which affect the wealth effect on saving/consumption allocation and pensions through the stock market, respectively. Moreover, the credibility of government actions influences: first, the tax system, which favors more and more the mobile factors and, through the effective demand, also affects the profits and wages and therefore the stock market prices; second, the monetary policy, especially as the financial market stabilizer. Based on the availability of data, this paper tested either the long-run relationships of the Greek social security payments vs. aspects and size of the financialization or their short-run transition mechanisms' causalities.

The main conclusion is that several mechanisms of the finance-led growth regime (Boyer 2000), which stands as a basic foundation of the financialization paradigm, are considered to be compatible with the findings of the paper.

In Section 2, the theoretical foundations of the main aspects of the financialization paradigm are briefly presented. The methodology, including the data and the modeling adopted from the study, are also described. In the Section 3, the empirical analysis, reporting, and discussion of the estimations and findings are presented. The final section concludes the paper, presenting its policy implications and contribution to the relevant theory, as well as future research directions.

## 2. Materials and Methods

### 2.1. Literature Review

The term financialization probably appeared in the 1990s, but its origins could be found in precursor concepts, such as "financial capital" used by Kalecki and Keynes or "casino society" (Magdoff and Sweezy 1987), and can arguable even be linked to "finance capitalism" (Varoufakis 2011). Its limits have been explored with a systematic approach in Erturk et al. (2008) and in Mader et al. (2020). Grounding on the history of economic thought, the concept exists in several fields and schools, such as corporate governance (Berle and Means 1932; Fama and Jensen 1983; Lazonick and O'Sullivan 2000), the critical accounting approach of the Manchester School (Froud et al. 2000), regulation theory (Boyer 2000), heterodox economics (Stockhammer 2004; Epstein 2005), and cultural economy (Martin 2002; Langley 2004). The scholarship since the GFC-2008, includes, but is not limited to, institutional investors and investment vehicles, as well as a host of different markets such as bond markets, commodity markets, housing markets, welfare markets, and even the resilience of finance and financialization postcrisis, as it surprisingly has not died since

then, and so on (for detailed references, see [Mader et al. 2020](#)). What unite its scholars are the following: first, they understand the finance as an autonomous realm, which dominates not only the economy but also the society and the state; second, they generally assess this progress as negative because it gives rise to inequality, macroeconomic instability, social precarity, and loss of democratic accountability; third, they study finance not only as an economic issue, but as embedded mainly within the society, epistemology, and politics. Thus, besides the seminal aforementioned definition of [Epstein \(2005\)](#), they define the financialization, for example, as “a pattern of accumulation in which profits accrue primarily through financial channels rather than through trade and commodity production” ([Krippner 2005](#)); “all the elements of national demand bear the consequences of the dominance of finance” ([Boyer 2000](#)); “insinuates an orientation toward accounting and risk management into all domains of life” ([Martin 2002](#)); “increased activity of non-financial businesses on financial markets, [ . . . ] measured by the corresponding income streams” ([Stockhammer 2004](#)); “designate[s] the changes that have taken place in the relationship between the non-financial corporate sector and financial markets” ([Orhangazi 2008](#)); “changes induced by the rhetoric of shareholder value [which] set firms and households utopian objectives such as value creation by management intervention for giant firms or security through stock-market saving for households” ([Froud et al. 2000](#)), etc.

In this study, among the four already mentioned approaches of financialization (see introduction), we focus on the emergence of a new regime of accumulation and, especially, on the finance-led growth regime proposed by [Boyer \(2000\)](#); however, key concepts on the shareholder value approach necessary for our empirical modeling are also mentioned. The seminal paper of the sociologist [Krippner \(2005\)](#) is the starting point examining the scholarship as a new regime of accumulation. She has shown, in the case of the US since the 1970s, that not only the size of the financial sector increased but, more importantly, that the nonfinancial corporations increasingly earned more from interests, dividends, and capital gains than from productive investments. On the other side, these nonfinancial firms also increasingly paid a lot to the financial sector for interests, dividends, and share-buybacks. In this double governance of the nonfinancial firms, the “crowding out” effect was founded, explaining, first, the reason for having shifted their investments in tangible assets from production of goods and services to finance, and second, the financial origins of the new regime of accumulation. These patterns were confirmed in the European case, too (e.g., [Stockhammer 2004](#)). Thus, the manufacturers facing the international competition and domestic demand of shareholders for dividend distribution reacted with globalization, shifting their production offshore as well as controlling the cost through foreign supply chains. The resulting productivity gains have been used to pay dividends to shareholders and buy financially innovated products ([Baud and Durand 2012](#)). Thus, globalization ended up being complementary to financialization. Based on these theses and relevant empirical evidence, heterodox economists have developed the finance-led growth regime. Financialization has been raised due to increased income from trade on financial assets of the “rentiers”, either firms or individuals, since the 1980s and 1990s. Because the distribution of income is a zero-sum game, the share of the rentiers was obtained against the wage-earners and households; the latter, facing wage stagnation and intending to maintain their purchasing power, became indebted. These dynamics produced an unstable economic system in the long run derived from high private debts and low growth rate of the real gross domestic product (GDP), which is when households default on their loans ([Epstein and Jayadev 2005](#); [Stockhammer 2012](#)). The volatility of asset prices, powered by the crowding-out effects toward financially innovative products and the accumulation of the private sector’s debt, increased financial fragility. The scholars of the finance-led growth regime based on ideas from Keynes and Minsky showed the endogenous nature of systemic risk for recurring crises fed by debt-driven consumption and housing bubbles ([Epstein 2005](#); [Becker et al. 2010](#); [Kaltenbrunner 2010](#); [Deutschmann 2011](#)). That is why they have not explained the GFC-2008 in terms of the efficient market hypothesis or regulatory failures but as a logical culmination of the financialization process. The last one cannot be explained

only with economic terms, because it is mainly a political project linked to the neoliberalism and the hegemony of the USA. The massive inflow of international financial capital into America's markets did not just come from the collapse of the Bretton Woods system but also clearly by the deregulation of financial markets worldwide, the liberalization of financial transactions, the banks' securitization and commercialization of assets and relevant risks in derivative markets, as well as by the post-war firms' participation in the Eurodollar markets (Konings 2008; Varoufakis 2011; Krippner 2012; van der Zwan 2014). As for the scholars in the new regime of accumulation, the financialization and neoliberalism are closely related regardless of the direction of causality (Dumenil and Levy 2004; Kotz 2010).

Furthermore, a comprehensive interdisciplinary analysis developed by Boyer (2000), takes into account the history and international relations—politics—of the economics of the financialization process. In an economy imposed on by financial logic, he explains that five elements are crucial: First, the shareholder value, as a new form of competition and governance mode, meaning the managers of firms must increase the internal rate of return to levels required by international investors. This transformation is more profound, and it does not only affect the volume, direction, and mode of financing investments by managers (Boyer 2000: Figure 3, Arrow A); Second, they adjust their techniques so as to respond effectively to the major target of the required shareholder value, especially as the competition shifts from goods and services to financial markets, based on the criterion of the rate of return, as the necessity of flexible labor contracts far away from organized regimes (Boyer 2000: Figure 3, Arrow B). Third, there are also strong transformations for the households, meaning their wages or salaries should be adjusted to cover any discrepancy between actual and expected returns; nevertheless, they have the opportunity to participate in the financial gains, through either equity holdings or, much more likely, the intermediation of pension funds; thus, the financial markets directly affect the decision on consumption or saving; that is way this model is so-called “equity-based or patrimonial”; indeed, it is the financial markets' wealth which leads to the consumption or housing for households or the indebtedness of the banks (Boyer 2000: Figure 3, Arrow C). Fourth, the state–economy relationship was profoundly changed; the failure of the efforts to reduce the public debt during the 1980s and 1990s have made the expenditures or transfer payments of the general government constrained by the yields of the bonds determined in the bond markets (Boyer 2000: Figure 3, Arrow F); given the macroeconomic illness of “secular stagnation” since then, the reduced fiscal space of the government presses taxes more and more on the less-mobile factors such as the labor and, possibly, fixed assets (Boyer 2000: Figure 3, Arrow E); thus, the taxation cannot remain in the Keynesian logic of the anticyclical policy and is obliged to be more procyclical. Fifth, the monetary policy does not only aim any longer at the price stability in order to be able to promote economic growth; it is considered to probably be more important to affect the expectations of investors to achieve financial stability, too; the difficult modern task of the central bank refers to compromising with the traditional “policy mix” and the new complex so as to contain the rational expectations, especially of the speculators, and achieve the stability of the financial markets (Boyer 2000: Figure 3, Arrow G).

A sixth crucial element for this study refers to the social security system; the demographic decline or the aging of the Western countries resulting in either heavily constraining the financing of national insurance systems by redistribution, or contributing to the fragility of pension funds, and these brought about the necessity of the privatization of elements of the system through the capital market. Thus, since a large part of savings is professionally managed, aiming to optimize returns paid on pensions' horizons, the “markets” affect the employment (Boyer 2000: Figure 3, Arrow B). The pension funds, clearly having a long-term horizon, could affect the trend of the financial markets, compensating, to some extent, short-term speculative behaviors (Boyer 2000, Arrow D).

Furthermore, the shareholder value orientation in the financialization approaches is studied as a guiding principle of corporate behavior (van der Zwan 2014). All four approaches are intercorrelated and ought to be taken into account as a whole. This is based

on the new regime of accumulation and the finance-led growth one in order to analyze their consequences regarding the management of nonfinancial corporations. This scholarship draws the principal-agency theory introduced by [Fama and Jensen \(1983\)](#) and further develops the incentives of managers to maximize shareholders' value. So, it analyzes the remedies for their gap, discovering several business practices about financial performance measures which could discipline managers and link their compensations to them, that is, the return on equity, or the international accounting standards or even quarterly instead of yearly reporting. In this way, in their endeavor to achieve the required high performance, the managers restructure firms' activities not only on their core competences by outsourcing productive ones, but they also use techniques such as mergers and acquisitions, hostile takeovers, or even leveraged buyouts, and so on. Consequently, they constantly focus on the valuation of their financial performance from the stock market and redistribute, respectively, the income of their financialized corporations among shareholders, themselves, and employees. The crucial point that makes the difference from the old theory of corporate performance is that the resulting financial gains are not reinvested within the firm, but they are distributed to shareholders through dividends and share buybacks ([Lazonick and O'Sullivan 2000](#); [Davis et al. 1994](#); [Dobbin and Zorn 2005](#)). Top managers have benefited the most from the shareholder value behavior through the shift of their payments toward stock options, hence the paradox on shareholder value vs the power of the managers and, especially, the chief executive officers (CEOs) ([Chizema 2010](#); [Boyer 2005](#)). Once again, because it is about a zero-sum game, the low-skilled or lower-wages employees have suffered the most from this significant change in the "dual labor market" compared to the high-skilled employees and managers; the declining of the working conditions such as job losses, cutbacks, job intensity, and job insecurity have raised social inequality. The unprecedented rising of inequality associated with the financialization paradigm is still a striking event even though it began in the 1990s ([Deutschmann 2020](#)).

## 2.2. Methodology

We used deductive reasoning (theory → research question and hypotheses → observation → confirmation). More specifically, as for the theory, this study is founded on the financialization literature that was sketched in the previous paragraph. It is argued that since the social contributions and benefits paid (SCBP) as transfer payments are included in the economic strategy of the governments, which gradually joined the financialization paradigm, then the research question derived from this theory can be expressed as follows: "has the Greek social security system been used by the economic policy with a financial logic, in the adjusting of the entire economy to the global financialization model, during the period 2000q1–2021q3?"

Furthermore, the financial logic can be tested through the falsifiable ([Popper 1959](#); [Kuhn 1962](#); [Andersen and Hepburn 2020](#)) research hypotheses:

**H1.** *Are there long-run or steady-state relationships between the size of the social security payments and relevant variables expressing aspects of the gradually financialized Greek economy? These variables measure either the weight of financial and insurance, plus real estate, activities in the gross value added, the growth rate of financial assets of the monetary and financial institutions, or even the portfolio investments in equity and investment fund shares, as well as some others described in the section of the data and estimations.*

**H2.** *Are there long-run or steady-state relationships between the size of the social security payments and relevant variables expressing aspects of the gradually financialized Greek public sector (that is, general government)? These variables, for instance, can be either the public debt, the budget balance, or even their fiscal space, as well as the yield of the Greek government's 10-year benchmark bond, as explained in the following section.*

**H3.** *If any or even both of the previous falsifiable research hypotheses H1 and H2 cannot be rejected, then through what mechanisms have they been established? One simple way to detect these is with*

*the Granger causality tests that are used here. Of course, one has to bear in mind that these Granger tests do not indicate economic causality but only statistical dependence of the testable variables.*

Furthermore, a sample of quarterly time series data for the Greek economy was drawn from a relevant database in order to estimate the long-run relationships of H1 and H2 through the appropriate time series models (here ARDL) first, and the Granger causalities of the H3 second. Thus, it can be indicated whether the estimated data generating processes with the tests of causalities are compatible with these three research hypotheses, which identify the research question. More specifically for the empirical analysis—the econometric part—the core of the study is referred to “the Auto-Regressive Distributed Lag (ARDL) model” of order  $p$  and  $q$ , denoted  $ARDL(p, q)$ . This, in the form of the “levels equation”, there are regressions regarding the dependent variable on  $p$  of its own lags and on  $q$  lags of one or more additional regressors. Multiple regressors are allowed to have different lag orders, in which case the model becomes an  $ARDL(p, q_1, \dots, q_k)$  model, where  $k$  is the number of nondeterministic regressors. ARDL models can, among other things, be used for the estimation and testing of level relationships. Key contributions in this area were made by [Pesaran and Shin \(1999\)](#) and [Pesaran et al. \(2001\)](#). (STATA, v. 14.2). In this paper, the error correction form (ECM) representation of the output of estimations (Table 3) was selected. ECM representation is derived by dividing the coefficient for the levels regressors by the coefficient of the lagged dependent variable and appropriately accounting for model deterministics ([Hassler and Wolters 2005, 2006](#)). It separates the adjustment coefficient to deviations from the long-run equilibrium (Panel C Diagnostic Statistics, line “PSS (2001) bounds test” in the bottom of Table 3), long-run coefficients (Panel A of Table 3), and short-run coefficients (Panel B of Table 3).

It should be mentioned that the [Pesaran et al. \(2001\)](#) estimation approach used in this paper has three main advantages over other methods of cointegration: it obviates the unit root pretests to identify the degree of integration of the time series; it can be used with either  $I(0)$  or  $I(1)$  variables, but not  $I(2)$ ; and a one-step simultaneous estimation on both long-run and short-run models is applied. The procedure involves three stages ([Goel et al. 2008](#)): first, searching the long-run (level) relationship among the variables applying the bounds tests through the estimation of a conditional ECM; second, the lagged dependent-variable term and the one-period lag on regressors are tested for the joint significance via an F-test, under the (null)  $H_0$ : “variables have not relation in levels” and the critical values of [Pesaran et al. \(2001\)](#), and a supplementary  $t$ -test is available for the significance of the lagged dependent variable, with critical values again provided by [Pesaran et al. \(2001\)](#); third, if from the previous tests a level relationship cannot be rejected, then the long-run (or cointegrated) one is estimated through the ARDL procedure as proposed by [Pesaran and Shin \(1999\)](#). STATA/SE version 14.2 software was used, and relevant ARDL estimations are presented in Table 3.

Finally, in the attempt to estimate the transition mechanisms from the short-term dynamics to the long-term steady state (cointegrated level), we applied Granger causality tests. The variables included in the respective vector autoregressive (VAR) equations, so as to apply the short-run Granger test, are those derived from the respective ARDL-identified models of the previous stage (Table 4).

All the quarterly time series data for the Greek economy used in this study were derived from the Refinitiv/Datastream database. Due to lack of data in some variables, the time period of the unbalanced sample ended up being the 2000q1–2021q3. The dependent variable of interest, so as to represent the social security system, was considered to be the “social contributions and benefits paid” (SCBP) provided by the Eurostat and accessed via the Datastream. We used the ratio of total SCBP on gross domestic product (GDP) to estimate its size in the economy (labeled hereafter as “scbtotgdp”). In this regard, all variables were measured either as ratios of the (nominal and seasonally unadjusted) GDP or gross value added (GVA), or even, for econometric reasons, as growth rates (gr). Detailed definitions of the variables and data sources are given in the Table A1 of the Appendix A.



Based on the availability of data, the variables used as explanations and reflecting the financialization are as follows.

(A) For the total Greek economy: as measures of the size or the growth of the financial-sector activities on the economy, either 1–2, the financial and insurance activities (+these of the real estate), as a ratio of GVA ( $fitotgva$ ,  $(firetotgva)$ ); or 3, the growth rate of the assets of monetary and financial institutions ( $mfifagr$ ); or 4, the capital flights, as a ratio of GDP ( $capflightgdp$ ), in order to represent the hot money for pure speculative purposes; or 5, the portfolio investments, equity, and investment fund shares, in the financial account of the liabilities of the balance of payments, as a ratio of GDP ( $prtfieqligdp$ ), so as to capture the trend of capital inflows/outflows of the country; or 6, the growth rate of the financial times stock exchange (FTSE) index of large capitalization in the Athens stock exchange ( $ftselcgr$ ), in order to represent, among others, the desire to invest based on expectations generated by economic policy and prospects of the country; more specifically, all the three previous variables ( $(capflightgdp)$ ,  $(prtfieqligdp)$ , and  $(ftselcgr)$ ) are used to represent the basic Keynesian concept of “animal spirit”, i.e., the psychological and emotional factors driving investors to take actions on the “markets” ( $\equiv$  financial and capital ones); 7, the money supply M3 outstanding amounts, as a ratio of GDP ( $m3outsgdp$ ); especially, the last two variables are included in the sample so as to take into account the “financial instability” measured by rapid credit growth ( $m3outsgdp$ ) and volatility of asset prices ( $ftselcgr$ ) (Borio and Lowe 2002).

(B) Particularly for the public sector (i.e., the general government as it is defined in ESA 2010): 8, the growth rate of the long-term public debt ( $pudbtgr$ ); 9, the primary (or gross) budget balance, as a ratio of GDP ( $primsubgdp$  (or  $grosbubgdp$ )); 10, the change of the yield of the Greek government’s 10-year benchmark bond ( $dgr10ygby1$ ); all the three previous variables (public debt, budget balance, and yield of the benchmark government bond) mainly represent the financialization of the state, as they refer to all the three respective strands of the literature, namely, the financialization as a new regime of accumulation, the shareholder value, or the calculating practices of the CRAs; 11, the fiscal space of the public debt ( $fspudbt$ ) in order to evaluate the disposable financial means the government has to support the social security system, defined as  $fspudbt = pudbtgdp / taxbase$ , where  $pudbtgdp$  is the public debt as a ratio to GDP, while the taxbase is the ratio of total general government revenues ( $tggrev$ ) of the five-years averaged GDP, so as to capture economic and political cycles, i.e.,  $taxbase = tggrev / (5 \text{ years averaged GDP})$ ; and 12, the fiscal space of the gross budget balance (including installments and interests of the debt) ( $fsgrossub$ ), i.e.,  $= grosbubgdp / taxbase$ , where  $grosbubgdp$  stands for the government gross budget balance as a ratio of the GDP.

Thus, based on the literature review of the second section, the long-run model is specified as the following Equation (1).

$$scbtotgdp_t = a + X_{jt} + \varepsilon_t \tag{1}$$

where  $X_j = 1, \dots, 12$  of the previously presented explanatory variables;  $t =$  time in quarters;  $\varepsilon_t =$  the disturbance term.

By implementing the Pesaran et al. (2001) bounds testing approach for the cointegration and by rewriting Equation (1) in an error-correction model form, the short-run effects of the financialization factors on the SCBP are presented in the following Equation (2a) (Hajilee et al. 2021).

$$\Delta scbtotgdp_t = a + \sum_{k=1}^{nj} \beta_{t-k} \Delta X_{jt-k} + \lambda_j X_{jt-1} + \zeta_t \varepsilon_{t-1} + \mu_t \tag{2a}$$

To demonstrate the long-run relationship, we need to control two criteria, namely, the sign and significance level of the error-correction coefficient ( $\zeta_t$ ); a significant negative  $\zeta_t$  is an indication of a long-run relationship or cointegration.

Equation (2a) has been estimated in four different versions presented in Table 3; we named, first, Model 1 (with  $X_j = firetotgva, ftselcgr, m3outsgdp, capflightgdp, prtiefieqligdp$ ) and Model 2 (with  $X_j = mfifagr, ftselcgr, m3outsgdp, capflightgdp, prtiefieqligdp$ ) “financialization of the Greek economy and financial instability factors”, and second, Model 3 (with  $X_j = pudbtgr, primbubgdp, gr10ygby, fitotgva$ ) and Model 4 (with  $X_j = fspudbt, fsgrosbub, mfifagr$ ) “financialization of the state”. An example of the analytical form of Model 1 (Table 3) as a special case of Equation (2a) is presented in the following Equation (2b).

$$\begin{aligned} \Delta scbtotgdp_t = & a + \sum_{k=1}^{n1} \beta_{t-k} \Delta firetotgva_{t-k} + \sum_{k=1}^{n2} \beta_{t-k} \Delta ftselcgr_{t-k} + \sum_{k=1}^{n3} \beta_{t-k} \Delta m3outsgdp_{t-k} \\ & + \sum_{k=1}^{n4} \beta_{t-k} \Delta capflightgdp_{t-k} + \sum_{k=1}^{n5} \beta_{t-k} \Delta prtiefieqligdp_{t-k} + \lambda_1 firetotgva_{t-1} + \lambda_2 ftselcgr_{t-1} \\ & + \lambda_3 m3outsgdp_{t-1} + \lambda_4 capflightgdp_{t-1} + \lambda_5 prtiefieqligdp_{t-1} + \zeta_t \varepsilon_{t-1} + \mu_t \end{aligned} \tag{2b}$$

Regarding the transmission mechanisms, for the test of whether the SCBP Granger-caused any explanatory  $X_j$ , the SCBP (or any  $X_j$ , respectively) function is defined as follows:

$$scbtotgdp_t = \delta_1 + \sum_{i=1}^p \alpha_i scbtotgdp_{t-i} + \sum_{i=1}^p \beta_i X_{jt-i} + u_t \tag{3}$$

$$X_{jt} = \delta_2 + \sum_{i=1}^p \pi_i X_{jt-i} + \sum_{i=1}^p \varphi_i scbtotgdp_{t-i} + v_t \tag{4}$$

We reject the  $H_0: \beta_l = 0$ , for  $l = 1, \dots, p$ , which means  $X_j$  does Granger-cause  $scbtotgdp$  if the  $\beta_l$  coefficients, in Equation (3), are jointly significant. We do not reject the  $H_0: \varphi_l = 0$ , for  $l = 1, \dots, p$ , which signifies that  $scbtotgdp$  does not Granger-cause  $X_j$  if the  $\varphi_l$  coefficients, in Equation (4), are jointly insignificant. If both previous tests are valid, it is said that  $X_j$  Granger unidirectionally causes  $scbtotgdp$  (unidirectional Granger causality). It is possible to have Granger causality in both directions (bidirectional Granger causality) if both  $\beta_l$ s and  $\varphi_l$ s are significantly different from zero, which means that a feedback relationship exists. It is also possible to have inverse Granger causality if  $\varphi_l$ s are significantly different from zero, but  $\beta_l$ s are not significantly different from zero; then, it is said that  $scbtotgdp$  Granger-causes  $X_j$ . These tests were performed under the conditions of the time series being stationary,  $\delta_1$  and  $\delta_2$  being the intercepts,  $u_t$  and  $v_t$  being white noise error terms, and the optimal lag length  $p$  being selected through information criteria, such as the Akaike or Bayesian criteria, etc. (Hajilee et al. 2021).

### 3. Results: Findings and Discussion

Thus, to understand the distribution of these 13 variables, the basic descriptive statistics are offered in Table 1, while their pairwise deterministic correlation coefficients are presented in Table 2.

With a coefficient of variation around 10% the mean of the dependent variable in the study, “social contributions and benefits paid” is strongly representative of the trend and was calculated to be at around 43% of the Greek GDP. We do not intend to examine if these payments of 43% of the GDP, on average, are high, low, or average compared to the European partners of Greece. We mainly aim to estimate if there are stochastic long-run relationships of the dependent variable with variables expressing the complex phenomenon of financialization. Indicative only from Table 1, it is worth noting that measures of financialization, such as the share of financial, insurance, and real estate activities in the total value added ( $firetotgva$ ) (or the growth rate of financial assets of the monetary and financial institutions ( $mfifagr$ )) average around 19% (1% per quarter) in the period 1995q1–2022q1 (1999q3–2022q1). This can also be verified from the relevant graphs in Appendix A, for instance, Figures A2 and A3 referred to  $firetotgva$  vs.  $fitotgva$  or  $mfifagr$ . Indicatively, from Table 2 it is remarkable, for instance, that six out of twelve explanatory variables are statistically correlated with the dependent variable (SCBP). In

addition, the growth rate of financial assets of the monetary and financial institutions (*mfifagr*) is surprisingly statistically uncorrelated with the dependent variable (*scbtotgdp*) but also with those of public debt and budget balance, although the opposite occurs for (*firetotgva*). It is a surprise because the mentioned institutions are obliged by law to include in their portfolio the bonds of the government, through which they fund the social security system. Regarding some strange results of Tables 1 and 2, you should bear in mind that they do not refer to stochastic properties of the series of the sample.

**Table 1.** Descriptive Statistics.

Variable	Obs	Mean	Std. Dev.	Min	Max
<i>scbtotgdp</i>	91	0.4268	0.0459	0.3426	0.5174
<i>firetotgva</i>	109	0.1880	0.0346	0.1406	0.2573
<i>ftselcgr</i>	99	−0.0024	0.1663	−0.4279	0.4030
<i>m3outsgdp</i>	108	3.7618	0.5502	2.6755	5.2945
<i>capflightgdp</i>	108	−0.0085	0.0449	−0.2484	0.2124
<i>prtfieqligdp</i>	91	0.0094	0.0294	−0.0392	0.1596
<i>mfifagr</i>	90	0.0102	0.0760	−0.1275	0.2133
<i>pudbtgr</i>	87	0.0079	0.0346	−0.2001	0.0991
<i>primbubgdp</i>	94	0.0172	0.0778	−0.2959	0.1370
<i>gr10ygby1</i>	100	0.0662	0.0467	0.0070	0.2540
<i>fitotgva</i>	109	0.0461	0.0059	0.0338	0.0625
<i>fspudbt</i>	88	3.0521	0.9506	1.8317	5.3373
<i>fsgrosbub</i>	80	−0.2981	0.2872	−1.5446	0.0258

Notes: The definition and relevant sources of all the variables are presented in Table A1 of the Appendix A, where relevant Figure A1, Figure A2, Figure A3, and Figure A4 for key time series can also be seen.

**Table 2.** Correlation matrix.

	<i>Scbtotgdp</i>	<i>Firetotgva</i>	<i>Ftselcgr</i>	<i>M3outsgdp</i>	<i>Capflightgdp</i>	<i>Prtfieqligdp</i>	<i>Mfifagr</i>	<i>Pudbtgr</i>	<i>Primbubgdp</i>	<i>Gr10ygby1</i>	<i>Fitotgva</i>	<i>Fspudbt</i>	<i>Fsgrosbub</i>
<i>scbtotgdp</i>	1												
<i>firetotgva</i>	0.83 *	1											
<i>ftselcgr</i>	−0.04	−0.12	1										
<i>m3outsgdp</i>	0.69 *	0.62 *	−0.07	1									
<i>capflightgdp</i>	0.08	0.06	0.19	0.02	1								
<i>prtfieqligdp</i>	−0.11	−0.04	0.12	−0.11	0.11	1							
<i>mfifagr</i>	0.15	0.16	−0.09	0.32 *	0.06	−0.12	1						
<i>pudbtgr</i>	0.11	0.1	−0.13	0.18	−0.06	−0.06	0.08	1					
<i>primbubgdp</i>	−0.32 *	−0.2	0.06	−0.47 *	−0.06	0.1	−0.02	−0.26 *	1				
<i>gr10ygby1</i>	0.30 *	0.42 *	−0.11	−0.05	0.1	−0.1	−0.07	0.01	−0.24 *	1			
<i>fitotgva</i>	0.43 *	0.56 *	0.03	0.23 *	0.06	0.05	0.28 *	0.04	0.08	−0.12	1		
<i>fspudbt</i>	0.76 *	0.90 *	−0.04	0.68 *	0.09	−0.09	0.1	0.13	−0.07	0.33 *	0.41 *	1	
<i>fsgrosbub</i>	−0.1	0.05	−0.06	−0.16	−0.22 *	0.17	0.18	−0.23	0.69 *	−0.37 *	0.35 *	0.03	1

Note: Stars (\*) indicate all the correlation coefficients significant at the 5% level or better.

It should be pointed out that the premise of Pesaran et al. (2001), namely, that “there are no I(2) variables on the ARDL model to be estimated”, is met. In Table A2, the results of the augmented Dickey–Fuller (ADF) tests are reported, which show that all the 13 s differenced variables are stationary.

In Table 3, the estimations of the linear ARDL models are presented. We should start from Panel C “Diagnostic Statistics, PSS (2001) bounds tests and Adjustment ECTerm”, from which both the F-test and t-test confirm the existence of a long-run relationship for all the four models; this implies that both research hypotheses H1 and H2 cannot be rejected. The negative sign and strong significance of the estimated coefficients of the ECM vary between −0.53 and −0.93 and indicate fast adjustment of the system. That is, between 53%

and 93% of the total difference from the short-run dynamics to the long-run equilibrium trend was occurring within the coming quarter of the sample period.

**Table 3.** Autoregressive distributed lag (ARDL) estimations.

	<b>Model 1</b>	<b>Model 2</b>
	ARDL (4,0,4,1,1,4), 2000q1–2021q3, financialization of the Greek economy and FIF	ARDL (4,0,4,1,1,3), 2000q4–2021q3, financialization of the Greek economy and FIF
D.scbtotgdp		
<b>Panel A. Long-Run Relationship</b>		
dfiretotgva	0.873(0.12)	—
mfifagr	—	−0.101(0.087) *
ftselcgr	−0.160(0.001) ***	−0.0860(0.001) ***
m3outsgdp	0.0154(0.087) *	0.0240(0.000) ***
capflightgdp	0.426(0.015) **	0.373(0.000) ***
prtfieqligdp		
q1	−0.0365(0.000) ***	−0.0278(0.000) ***
q2	0.0183(0.016) **	0.0115(0.075) *
q3	−0.0259(0.000) ***	−0.0234(0.000) ***
d2013q1		−0.032(0.000) ***
d2011q2	—	0.033(0.000) ***
Time Trend	0.000794(0.000) ***	0.00102(0.000) ***
Constant	0.0537(0.060) *	0.115(0.000) ***
<b>Panel B. Short-Run Relationship</b>		
LD.scbtotgdp		
L2D.scbtotgdp	−0.394(0.000) ***	−0.258(0.000) ***
L3D.scbtotgdp		
D.ftselcgr	0.0750(0.000) ***	0.0726(0.000) ***
LD.ftselcgr	0.0747(0.000) ***	0.0714(0.000) ***
L2D.ftselcgr	0.0397(0.000) ***	0.0456(0.000) ***
L3D.ftselcgr	0.0293(0.000) ***	0.0326(0.000) ***
D.m3outsgdp	0.0307(0.024) **	0.0554(0.000) ***
D.capflightgdp	−0.191(0.000) ***	−0.252(0.000) ***
D.prtfieqligdp		
LD.prtfieqligdp		
L2D.prtfieqligdp		−0.191(0.001) ***
L3D.prtfieqligdp	0.108(0.075) *	—

**Table 3.** *Cont.*

	<b>Model 1</b>	<b>Model 2</b>
	ARDL (4,0,4,1,1,4), 2000q1–2021q3, financialization of the Greek economy and FIf	ARDL (4,0,4,1,1,3), 2000q4–2021q3, financialization of the Greek economy and FIf
D.scbtotgdp		
<b>Panel C. Diagnostic Statistics</b>		
<b>PSS (2001) bounds test</b>	F = 8.129 ***; t = −4.761 ** (rej. H <sub>0</sub> at 5%)	F = 10.81 ***; t = −6.39 *** (rej. H <sub>0</sub> at 1%)
<b>Adjustment EC Term: L.scbtotgdp</b>	−0.535(0.000) ***	−0.931(0.000) ***
Ramsey RESET F-test	2.48(0.070)	1.87(0.146)
Breusch-Godfrey LM test for AR	0.566(0.452)	0.824(0.364)
Breusch-Pagan/Cook-Weisberg test	0.50(0.480)	1.17(0.279)
Mean VIF	5.68	6.71
Observations	87	84
Adj R-squared	0.8297	0.8533
	<b>Model 3</b>	<b>Model 4</b>
	ARDL (1,3,0,3,4), 2001q2–2018q4, Financialization of the State	ARDL (1,3,1,0), 2001q1–2018q4, Financialization of the State
D.scbtotgdp		
<b>Panel A. Long-Run Relationship</b>		
pubdtgr	0.416(0.0336) **	—
primbubgdp	—	—
dgr10ygby	0.0091(0.001) ***	—
fitotgva	−2.638(0.000) ***	—
fspudbt	—	0.0125(0.030) **
fsgrossub	—	−0.0641(0.000) ***
mfifagr	—	0.134(0.086) *
q1	—	—
q2	—	0.0268(0.008) ***
q3	−0.0382(0.000) ***	−0.0217(0.061) *
Time Trend	0.0016(0.000) ***	0.0011(0.000) ***
Constant	0.118(0.000) ***	0.107(0.000) ***

**Table 3.** Cont.

	<b>Model 3</b>	<b>Model 4</b>
	ARDL (1,3,0,3,4), 2001q2–2018q4, Financialization of the State	ARDL (1,3,1,0), 2001q1–2018q4, Financialization of the State
D.scbtotgdp		
<b>Panel B. Short-Run Relationship</b>		
LD.scbtotgdp	—	—
D.pudbtgr	−0.383(0.008) ***	—
LD.pudbtgr	−0.215(0.055) *	—
L2D.pudbtgr	−0.140(0.048) ***	—
D.dgr10ygby	—	—
L2D.dgr10ygby	−0.00381(0.029) **	—
D.fitotgva	3.351(0.000) ***	—
LD.fitotgva	—	—
L2D.fitotgva	—	—
L3D.fitotgva	1.277(0.026) **	—
D.fspudbt	—	—
LD.fspudbt	—	−0.0265(0.000) ***
L2D.fspudbt	—	—
D.fsgrosbub	—	0.0276(0.094) *
<b>Panel C. Diagnostic Statistics</b>		
<b>PSS (2001) bounds test</b>	F = 8.841 ***; t = −6.535 ** (rej. H <sub>0</sub> at 1%)	F = 13.57 ***; t = −6.87 *** (rej. H <sub>0</sub> at 1%)
<b>Adjustment EC Term: L.scbtotgdp</b>	−0.794(0.000) ***	−0.86(0.000) ***
Ramsey RESET F-test	0.91(0.445)	1.81(0.156)
Breusch–Godfrey LM test for AR	0.329(0.566)	0.000(0.995)
Breusch–Pagan/Cook–Weisberg test	0.69(0.405)	0.44(0.509)
Mean VIF	6.41	5.41
Observations	71	72
Adj R-squared	0.7896	0.7262

Notes: FIf = financial instability factors; *p*-values in parentheses; \*\*\* *p* < 0.01, \*\* *p* < 0.05, \* *p* < 0.1; PSS (Pesaran et al. 2001) H<sub>0</sub>: no level (LR or Cointegrated) relationship; Ramsey RESET H<sub>0</sub>: model has no omitted vars.; Breusch–Godfrey LM H<sub>0</sub>: no serial correlation; Breusch–Pagan/Cook–Weisberg test for heteroskedasticity H<sub>0</sub>: constant variance; VIF (=variance inflation factor) test for multicollinearity; q1(1, 2) stands for the seasonal dummy of the 1st (2nd, 3rd) quarter; d2013q1 (d2011q2) is a level dummy taking the value 1 since 2013q1 (d2011q2) and 0 otherwise and expressing the structural break of the scbtotgdp (mfifagdp) variable; D in front of the short-run vars. is the difference operator, and L(*j* = 1, . . . , 4) is the lag operator; insignificant estimated coefficients are not reported (see the previous in the bottom of estimated models 1–2).

In addition, at the same Panel C of Table 3, main diagnostic postestimation statistics are provided, such as the specification-error test of Ramsey; the Breusch–Godfrey Lagrange multiplier test for higher-order serial correlation in the disturbances; the Breusch–Pagan and Cook–Weisberg test for constant variance along with the assumption that the regression disturbances are independent-normal draws with variance  $\sigma^2$ ; the variance inflation factor (VIF) test for multicollinearity derived from the correlation of the independent variables specified in each model; and the adjusted R-squared model for the descriptive evaluation of the goodness of fit of the regressions. As can be seen from the associated *p*-values offered

in parentheses right next to the statistics, all four models overpass these tests, verifying the robustness of the estimated coefficients (especially those of the long-run or cointegrated relationships of Panel A of Table 3).

Table 4 presents the short-run Granger causality tests for the variables involved in the previous 1–4 models, so as to reply to the H3 research hypothesis “If any or even both of the previous falsifiable research hypotheses H1 & H2 cannot be rejected, then, through what mechanisms have they been established?”. Three main transition mechanisms from the short-run toward the steady-state of the financialized Greek social security system are identified; they are dependent upon the direction of the Granger causality, i.e., unidirectional, bidirectional, and inverse.

**Table 4.** Granger causality Wald tests of Social Contributions and Benefits Paid (scbtotgdp) vs. Financialization’s Factors.

	Null Hypotheses and Findings	Model 1	Model 2	Model 3	Model 4
A1	<i>dfiretotgva</i> does not Granger-cause <i>scbtotgdp</i> <i>scbtotgdp</i> does not Granger-cause <i>dfiretotgva</i> <i>dfiretotgva</i> → <i>scbtotgdp</i>	11.24 ** 3.57			
A2	<i>mfifagr</i> does not Granger-cause <i>scbtotgdp</i> <i>scbtotgdp</i> does not Granger-cause <i>mfifagr</i> <i>mfifagr</i> → <i>scbtotgdp</i>		10.03 ** 6.66		
B1	<i>ftselcgr</i> does not Granger-cause <i>scbtotgdp</i> <i>scbtotgdp</i> does not Granger-cause <i>ftselcgr</i> <i>ftselcgr</i> ↔ <i>scbtotgdp</i>	11.33 ** 11.04 **			
B2	<i>dgr10ygby</i> does not Granger-cause <i>scbtotgdp</i> <i>scbtotgdp</i> does not Granger-cause <i>dgr10ygby</i> <i>dgr10ygby</i> ↔ <i>scbtotgdp</i>			16.9 *** 11.3 **	
B3d	<i>mfifagr</i> does not Granger-cause <i>scbtotgdp</i> <i>scbtotgdp</i> does not Granger-cause <i>mfifagr</i> <i>mfifagr</i> ↔ <i>scbtotgdp</i>				8.2 * 12.3 **
C1d	<i>ftselcgr</i> does not Granger-cause <i>scbtotgdp</i> <i>scbtotgdp</i> does not Granger-cause <i>ftselcgr</i> <i>ftselcgr</i> ← <i>scbtotgdp</i>		6.15 14.6 ***		
C2	<i>m3outsgdp</i> does not Granger-cause <i>scbtotgdp</i> <i>scbtotgdp</i> does not Granger-cause <i>m3outsgdp</i> <i>m3outsgdp</i> ← <i>scbtotgdp</i>		4.28 16.1 ***		
C3	<i>primbubgdp</i> does not Granger-cause <i>scbtotgdp</i> <i>scbtotgdp</i> does not Granger-cause <i>primbubgdp</i> <i>primbubgdp</i> ← <i>scbtotgdp</i>			3.64 13.2 ***	
C4	<i>fspudbt</i> does not Granger-cause <i>scbtotgdp</i> <i>scbtotgdp</i> does not Granger-cause <i>fspudbt</i> <i>fspudbt</i> ← <i>scbtotgdp</i>				5.6 7.9 *
C5	<i>fsgrosbub</i> does not Granger-cause <i>scbtotgdp</i> <i>scbtotgdp</i> does not Granger-cause <i>fsgrosbub</i> <i>fsgrosbub</i> ← <i>scbtotgdp</i>				5.7 13.2 ***

Notes: The values of the table express these of the  $\chi^2$  statistic, while asterisks stand for significancy level based on the *p*-values as usual, \*\*\* *p* < 0.01, \*\* *p* < 0.05, \* *p* < 0.1; in the first column, we classify the findings symbolizing with A as the Granger unidirectional causality, from a financial factor to the dependent variable (scbtotgdp), B as the Granger bidirectional causality and C as the Granger inverse-directional causality from the dependent to the financial factors; in the same classification, the lower case “d” stands for a double but different finding from another model.

Estimated models 1 and 2 reply to the research hypothesis H1: “Are there long-run or steady state relationships between the size of the social security payments and relevant variables expressing aspects of the gradually financialized Greek economy?”. Based on the PSS (2001) bounds tests already mentioned, the estimated long-run relationships between SCBP (as a

ratio to GDP) and the vector of regressors, either (*firetotgva*, *ftselcgr*, *m3outsgdp*, *caflightgdp*) in Model 1 or (*mfifagr*, *ftselcgr*, *m3outsgdp*, *capflightgdp*) in Model 2, are presented in Table 3, Panel A, Models 1–2.

All the regressors were found to be statistically significant at the 1%, 5%, or even around the 10% level. First, it seems that the relation between the size of the Greek social security system (*scbtotgdp*) and size of the financialization of the total Greek economy (*firetotgva*, *mfifagr*) is not strong; this follows from the findings for either the share of financial, insurance, and real estate activities to the GVA (*firetotgva*), or the growth rate of the financial assets of monetary and financial institutions (*mfifagr*), which are weakly significant (9–12% level). Second, a possible explanation for the positive sign of the *firetotgva* could be that since these industries grow, the employees and their needs for medical, pharmaceutical, or pension payments increase, too; if the last rate of growth of the dependent variable is faster than that of the GDP one, then *scbtotgdp* should increase; this reasoning makes more sense under the Pay-As-You-Go (PAYG) social security system that was prevailing in Greece until the Eurozone sovereign debt crisis of 2010–2015. It was the government budget which was charged with the social security costs, and not the private finance and insurance (and real estate here) sectors, and that is why it seems to be the foundation for the explanation of the positive sign of *firetotgva* in Model 1. Third, the negative sign of both the *mfifagr* (growth rate of financial assets of monetary and financial institutions) and the *ftselcgr* (growth rate of large cap. financial times stock exchange index in Athens) could be attributed to: the increase in financial assets and the relevant index of the stock market reflect the increasing investments and expectations of future income; thus, since the economy grows, the employees increase too, while the unemployment benefits decrease, which is in contrast with the contributions of employers and employees to the system, which should increase; so, all else equal, there is less load for the system. Once again, it is worth mentioning the key role of the PAYG Greek system. It also seems that the financial assets of the monetary and financial institutions should contain not many securities of the social security institutions. We think (and this is to be investigated in a future study), that the weak long-run relationship here (*mfifagr*–*scbtotgdp*) is founded on the gradually changed PAYG system, that is, due to reforms applied especially during the Eurozone sovereign debt crisis 2010–2015, one that changed toward one mixed with funded or occupational institutions so as to lighten the burden over the government budget and the resulting public debt. Fourth, financial instability factors (Borio and Lowe 2002), besides *ftselcgr*, such as the weight of the money supply (*m3outsgdp*), representing the credit expansion, and capital flights (*capflightgdp*), proved to have strong and positive significant influence on *scbtotgdp*; it could be explained through the increase in labor within the mentioned changes prevailing (until mid-2010s) in the PAYG system, based on the effectiveness of monetary expansion in rising income and employment given the output gap of the Greek economy during the sample period.

To sum up from Models 1–2, it seems that (a) the long-run relationship between the size of financialization and the relevant payments for the Greek social security system is rather weak; (b) the stock market progress works on countervailing the negative influence of financial instability factors such as the rapid credit expansion and capital flights on the system. Both these findings are in line with the debt-driven demand regimes of the financialization literature (Aalbers et al. 2020; Stockhammer and Kohler 2020; Karwowski and Stockhammer 2017; Boyer 2000).

Regarding the findings from the estimated Models 3 and 4, they relate to the research hypothesis H2: Are there long-run or steady state relationships between the size of the social security payments and relevant variables expressing aspects of the gradually financialized Greek public sector (that is, general government)? It has already been mentioned above that the answer in H2, as in H1, is affirmative based on the PSS (2001) bounds tests reported in panel C of Table 3. The estimated long-run relationships between the system and the vector of regressors, either (*pudbtgr*, *gr10ygby*, *fitotgva*) in Model 3 or (*fspudbt*, *fsgrsub*, *mfifagr*) in Model 4, are presented in Table 3, Panel A, Models 3–4.



A strong relationship between the financialized Greek public sector and the respective social security system was estimated in Model 3. The public debt growth rate ( $pudbtgr$ ) and the change of the yield of the 10-year government bond ( $dgr10ygby$ ) as a measure of the financialization of the public sector and especially as an aspect of the international financial markets' pressure on it (external financialization) and, consequently, on the social security system ( $scbtotgdp$ ), were proven to be statistically significant at the 5% and 1% level, respectively (moreover, the rising openness of the Greek economy can be seen directly from graph A4 in the appendix); the strongly significant and positive estimated long-run relationship ( $dgr10ygby-scbtotgdp$ ) underlines the key role of the cost of funding the deficits of the social security system via increasing public debt; it ( $pudbtgr$ ) was also estimated to be significant in explaining the variability of the dependent  $scbtotgdp$  toward its steady-state level. This evidence agrees with international finance literature findings that the market discipline is activated not by actually monitoring the variables in levels (here,  $pudbt$ ), but their relative figures ( $pudbtgdp$ ) or, even better, their growth rate (finally found significant here,  $pudbtgr$ ). Furthermore, the size of the financialization of the Greek economy, as measured this time from the share of financial and insurance activities on GVA ( $fitotgva$ ), was estimated to be strongly significant in Model 3, which is in contrast with the cases of Models 1–2 for relative variables ( $firetotgva$ ,  $mfifagr$ ); its negative steady-state relationship with the dependent  $scbtotgdp$  was expected under the premise of reforms of the PAYG system since 2010; that is, since the private insurance contracts are increasing, then at least those who are self-employed could decrease their contributions so that they pay the minimum required by the law to the social security system, so the payments of the system could be reduced.

Thus, in Model 3, we provide strong empirical evidence in favor of a long-run relationship of the Greek social security system ( $scbtotgdp$ ) and the financialization of the total economy ( $fitotgva$ ) or its public sector ( $pudbtgr$ ,  $gr10ygby$ ). It is noticeable that in only one linear ARDL equation of Model 3 is an affirmative reply to both research hypotheses H1 and H2 offered.

As for the Model 4 estimations, they confirm the long-run relationship between Greek government's fiscal space (represented by public debt ( $fspudbt$ ) and gross budget balance ( $fsgrossub$ )) and the social security payments ( $scbtotgdp$ ). Both the variables could be a good economic reason for the financialization of the state, which was proven in Model 3. The positive steady-state relationship of  $fspudbt-scbtotgdp$ , as expected, can reflect the obvious one, i.e., as the fiscal space in a more international image such as that of the public debt ( $fspudbt$ ) is enhancing, it makes the funding of the system or the rise of the respective payments ( $scbtotgdp$ ) easier. The opposite ends up on the fiscal space of the government gross budget balance ( $fsgrossub$ ), which proved to be strongly significant in explaining the variability of the dependent  $scbtotgdp$ ; the amelioration of the budget as a ratio of the total revenues ( $fsgrossub$ ) assumes that the government expenditures, including also the social security system ( $scbtotgdp$ ), should be reduced, hence the negative estimated relationship ( $fsgrossub-scbtotgdp$ ). Finally, the evidence from Models 1–2 on the weak relation of the financialization of the Greek economy with the social security system was also confirmed in Model 4; it is the growth rate of financial assets of the monetary and financial institutions ( $mfifagr$ ) that is estimated to be marginally significant (at the 8.6% level) and, moreover, to have a positive sign; it seems to be a puzzle, as it was expected to be negative as it was in Model 2. A possible explanation could originate from the restructuring of the sovereign debt since 2012 and the MoU conditionalities, with internal devaluation or austerity-implementing policies up to 2018, with radical labor market reforms leading to jobless recovery or badly paid employment with minimum contributions of employers or employees to the social security system; it should also be combined with the recapitalization of systemic banks and the restructuring of their nonperforming loans. This puzzle is a target of a specific future research paper.

To sum up, the findings from Models 3 and 4 are in line with the financialization literature, not only on the debt-driven but also the export-driven demand regimes, as

strong significance for the financialization of both the Greek economy as well as that of the state is reported (Model 3). These new regimes of capital accumulation are interdependent (Stockhammer and Kohler 2020). A descriptive confirmation for the Greek export-led, somewhat surprising, regime can be obtained from Figure A4 and respective statistics for the “trade openness” for goods and services during the sample period. It is clear that after the global financial crisis (GFC) of 2008 and the consequent collapse of trade, a strongly upward trend, especially after 2012, and the restructuring of the sovereign debt followed; hence, the Greek trade openness of approximately 40% of the GDP during the first decade of the Euro (2000s) leapt to 70% on average in the 2010s, ending up at 58% on average for the total period of 1995–2022. However, competitiveness difficulties of the productive model, mainly in the 2000s, are reported to reflect 25% exports and 33% imports in terms of GDP on average, as well as a greater variability of imports. Briefly, the great picture for internationally traded Greek goods and services is promising despite the ongoing crises since the GFC in 2008, including the pandemic and the current energy crisis.

As regards Table 4 we reported only the statistically significant findings. We classified them in three classes of transition mechanisms, named in the first column as A, found when a unidirectional Granger causality goes from the  $X_j$  regressor toward the dependent  $scbtotgdp$  ( $X_j \rightarrow scbtotgdp$ ). In this class, the  $X_j$ s  $firetotgva$  and  $mfifagr$  were classified; as B when a bidirectional Granger causality from the  $X_j$  regressor toward the dependent  $scbtotgdp$  and inversely ( $X_j \leftrightarrow scbtotgdp$ ) was estimated, that is, feedback effects were proven. In this class, the  $X_j$ s  $ftselcgr$  and  $dgr10ygyby$  were classified; as C an inverse Granger causality from the dependent  $scbtotgdp$  toward the  $X_j$  regressor ( $X_j \leftarrow scbtotgdp$ ) was estimated. In this class, the sources of financial instability, i.e., the  $ftselcgr$  and  $m3outsgdp$  (but not the  $capflightgdp$ ), the financialization of the state, the  $primubgdp$ , as well as the fiscal space,  $fspudbt$  and  $fsgrsubub$ , were classified. When  $X_j$  is found in the two different systems, the letter “d” is assigned, adding a mixed finding. In this class a unidirectional and bidirectional Granger causality for the relation ( $mfifagr-scbtotgdp$ ) was classified, while a bidirectional and an inverse Granger causality for the relation ( $ftselcgr-scbtotgdp$ ) was also classified.

These mentioned classes A–C of Table 4 express short-run transition mechanisms toward long-run equilibrium relationships estimated from the linear ARDL Models 1–4 and presented in Table 3; it is worth noting that the Granger causality test is in its essence a statistical instrument which has to be established by economic reasoning theory.

#### 4. Conclusions

This paper concludes that “the Greek social security system has been used by the economic policy with a financial logic, in the adjusting of the entire economy to the global financialization model, during the period 2000q1–2021q3”.

The findings offer empirical evidence compatible with several mechanisms of the aforementioned finance-led growth regime. The long-run negative significance of the financial and insurance sector ( $fitotgva$ ) is considered to be compatible with the relation “financial system  $\rightarrow$  privatization of elements of the social security  $\rightarrow$  pensions via stock market  $\rightarrow$  financial system”. Stylized facts that supported this in Greece can be financial intermediaries, such as EDEKT S.A. since 1999, or recently institutions for occupational retirement provision. The weakly positive significance of the change of the size of the broader financial sector, including, this time, the real estate sector ( $dfiretotgva$ ), for the size of the system, is also considered to be compatible with the relation “financial system  $\rightarrow$  patrimonial equity-based household behavior  $\rightarrow$  purchase of housing and durable goods  $\rightarrow$  secured borrowing  $\rightarrow$  financial system”. Relevant stylized facts can be seen by the respective graphs of Appendix A (especially that of Figure A2). A similar interpretation can be given for the significance of the growth rate of the financial assets of the monetary and financial institutions ( $mfifagr$ ), although there have been mixed results either in the signs of the long-run relations or in the Granger causality directions (feedbacks and unidirectional). Regarding the nexus “financialization of the state—size of the system”, the long-run relationships and short-run

Granger causality transition mechanisms were also proven to be significant. The long-run positive significance of either the change of the 10-year government bond yield (*dgr10ygby*) or the growth rate of the public debt (*pudbtgr*) and the size of the system (*scbtotgdp*) are noteworthy, as is the negative one of the fiscal space (*fsgrosbub*, *fspudbt*), which is aimed from the financialization logic; feedback effects were confirmed in the short-run for the *dgr10ygby* and inverse Granger causality from the size of the social “system” to the size of the primary budget balance (*primbubgdp*), as well as for those of the fiscal space (*fsgrosbub*, *fspudbt*). This financialization of the public sector is also considered to be compatible with the relation “*financial system* → *credibility of government actions* → *tax system favorable to less mobile factors* → *limitation of public borrowing* —and through effective demand → *profits & wages* → *stock market prices* → *monetary policy, financial market stabilizer* → *financial system*”. Last but not least, long-run relationships of financial instability factors, such as the negative growth rate of the large capitalization ftse index (*ftselcgr*) and the positive of both the size of the capital flights (*capflightgdp*) and of the money supply (*m3outsgdp*), along with the size of the system, were also proven to be significant; feedback effects in the short-run were confirmed for the *ftselcgr* and inverse Granger causality between the size of the money supply and size of the system; the relation “*stock market prices* → *monetary policy, financial market stabilizer* → *financial system*” of the finance-led growth regime is considered to be compatible with these findings.

A main limitation of the paper originates from the lack of detailed time series data so as to more closely approach the finance-led growth regime.

The policy and practical implications offered from the paper are straightforward. Since the dominance of the financialization paradigm cannot be rejected for Greece during the sample period, the constraint of the social security system will be the development of the financial system itself. Therefore, its sustainability, whether regarding PAYG or a funded one, should be discovered by the policy makers working on economic progress, by the creation of new jobs able to fund it, or, finally, by the reverse of the snowball effect. Given the very limited margins of conducting “independent” fiscal policy in the EMU and especially in Greece, (a sui generis member since 2009, which is strictly supervised by the ESM due to the fact that almost 80% of its sovereign debt is owed to loans of the Eurozone’s members), the leap in technology advancement, through the national educational system and the investments being exports-driven, with a balanced budget, could be the solution to the funding problem of the “system”. Young workers should bear in mind that the generous European welfare state can be back, for reasons of justice and reduction of inequality, only if the financialization of economy has (world-widely) been reduced.

This article contributes to the relevant literature by offering, first, innovative methodology, as it uses ARDL modeling for the first time in the field, as far as is known; second, empirical evidence on testing the financialization paradigm, also for the first time as far as is known, for a small open economy and Eurozone’s member such as Greece; third, that the main conclusion of the paper, that is, that the sample data are compatible with the finance-led growth regime, is independent of the global financial crisis of 2007–2009.

Further research directions should predict the extension and deepening of this study so as to include either some other aspects of the financialization, with emphasis on the structured finance and the calculating practices of the credit rating agencies, or more detail data, including, this time, the feedback effects of Greece’s membership to the European Economic and Monetary Union or, even, comparisons with other countries.

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## Appendix A

**Table A1.** Definition and sources of variables.

Title	Label	Definition Sources
Social Contributions and Benefits Paid (ratio to GDP).	<i>scbtotgdp</i>	Greece, Total Transactions (ESA 2010), Social Contributions and Benefits: Paid, Current Prices, Euro. REFINITIV/DATASTREAM/Eurostat <sup>1</sup> . t = quarters (Q), timespan = 1995Q1–2021Q4, discontinued for all variables. GDP = Greece, Gross Domestic Product, Expenditure Approach, Gross Domestic Product, Quarterly Levels, Current Prices, Euro. This var. is used if GDP is not referred to constant 2010 prices or real GDP. REFINITIV/DATASTREAM/Quarterly National Accounts, copyright OECD, for GDP.
Gross Value Added	GVA	Greece, Gross Domestic Product, Output Approach, Gross Value Added (GVA) at Basic Prices, Quarterly Levels, Current Prices, Euro. REFINITIV/DATASTREAM/Quarterly National Accounts, copyright OECD.
“Financial and Insurance (+Real Estate) Activities” share in (total) Gross Value Added (GVA) of the country.	A1. <i>fitotgva</i> ; A2. <i>firetotgva</i>	Greece, Gross Domestic Product, Output Approach, Financial and Insurance (+Real Estate) Activities, GVA as a ratio of the total GVA, at Basic Prices, Quarterly Levels, Current Prices, Euro. REFINITIV/DATASTREAM/Quarterly National Accounts, copyright OECD.
Monetary and Financial Institutions Assets (as a growth rate).	A3. <i>mifagr</i>	Greece, Financial Balance Sheets, Consolidated Stocks (SNA2008), Financial Assets, Total, Monetary Financial Institutions, Current Prices, Euro. REFINITIV/DATASTREAM/Annual National Accounts, copyright OECD.
Financial Openness (as a ratio to GDP)	A4. <i>prtfeqligdp</i>	Greece, Balance of Payments Standard Components (BPM6); Financial Account: Portfolio Investment, Equity and Investment Fund Shares, Assets or Liabilities; Euro. REFINITIV/DATASTREAM/IMF—International Financial Statistics.
Shareholder Value (growth rate of the ASE-relevant index)	B1. <i>ftselcgr</i> B2. <i>m3outsgdp</i>	Greece, FTSE/Athex (Athens Stock Exchange Market (ASE)) Large Capital. REFINITIV/DATASTREAM/Athens Stock Exchange Greece, Money Supply M3 Outstanding Amounts; million Euro. Ratio to GDP. REFINITIV/DATASTREAM/Bank of Greece
Public Debt (as a growth rate)	C1. <i>pubbtgr</i>	Greece, Public Debt, General Government, Long-Term, Total, Current Prices, not seas. adj., Euro. REFINITIV/DATASTREAM/World Bank QPSD.

Table A1. Cont.

Title	Label	Definition Sources
Budget Balance (as a ratio to GDP or growth rates)	C2. <i>primbubgdp</i> C3. <i>grosbubgdp</i>	Greece, General Government, Discontinued, Budget Balance (Gross = grosbub, or Primary = primbub), Total, Cumulative, Current Prices, not seasonally adjusted (nsa), Euro. REFINITIV/DATASTREAM/Hellenic Republic Ministry of Economy and Finance.
Fiscal Space	C4. <i>fspudbt</i> . C5. <i>fsgrosbub</i> .	$fspudbt = pudbtgdp / taxbase$ ; $fsgrosbub = grosbubgdp / taxbase$ . $taxbase = tggrev / (5 \text{ years averaged GDP to capture eco. and pol. cycles})$ . $tggrev = \text{Greece, Total General Government Revenue: Current Prices, Euro.}$ REFINITIV/DATASTREAM/Eurostat for TGGREV.
Yield of 10-year government bond	D1. <i>gr10ygby1</i>	Greece, Long-Term Government Bond Yields, 10-Year, Main (Including Benchmark), Yield 10-Year Government Bonds, nsa. REFINITIV/DATASTREAM/Main Economic Indicators, copyright OECD.
Capital Flight (as a ratio to GDP)	D2. <i>capflightgdp</i>	Greece, Balance of Payments, Capital Flight, Net, (millions of Euros adj.) Current Prices, nsa. $cflight \text{ (euro)} = cflight\text{-USD, EUR/USD spot exchange rate.}$ REFINITIV/DATASTREAM/Oxford Economics.

Notes: The numbering before the labels of the variables refer to, firstly, the four aspects of financialization (FNCZ), A = the new regime of accumulation, B = shareholder value, C = state's transformation, D = the influence of CRAs on society's mutation, and secondly, the characteristics, which we try to express with these proxy variables within each FNCZ aspect. <sup>1</sup> The European System of Accounts (ESA-2010, § 4.83) defines the "Social contributions and benefits (D.6) as: social benefits are transfers to households, in cash or in kind, intended to relieve them from the financial burden of a number of risks or needs [(a) sickness; (b) invalidity, disability; (c) occupational accident or disease; (d) old age; (e) survivors; (f) maternity; (g) family; (h) promotion of employment; (i) unemployment; (j) housing; (k) education; (l) general neediness], made through collectively organized schemes, or outside such schemes by government units and Nonprofit Institutions Serving Households (NPISHs); they include payments from general government to producers which individually benefit households and which are made in the context of social risks or needs."

Table A2. ADF Unit Root Test Applied to Second-Differenced Variable.

	Z(t) Statistic (The Model Contains Intercept and Trend)
<i>scbtotgdp</i>	−8.315 ***
<i>firetotgva</i>	−6.203 ***
<i>ftselcgr</i>	−10.026 ***
<i>m3outsgdp</i>	−6.140 ***
<i>capflightgdp</i>	−13.073 ***
<i>prtfieqligdp</i>	−11.023 ***
<i>mfifagr</i>	−10.589 ***
<i>pudbtgr</i>	−8.095 ***
<i>primbubgdp</i>	−7.782 ***
<i>gr10ygby1</i>	−6.386 ***
<i>fitotgva</i>	−5.738 ***
<i>fspudbt</i>	−7.691 ***
<i>fsgrosbub</i>	−6.644 ***

Notes: The null hypothesis is that tested variables contain a unit root, and it can be rejected here at 1% significance level (\*\*\*).

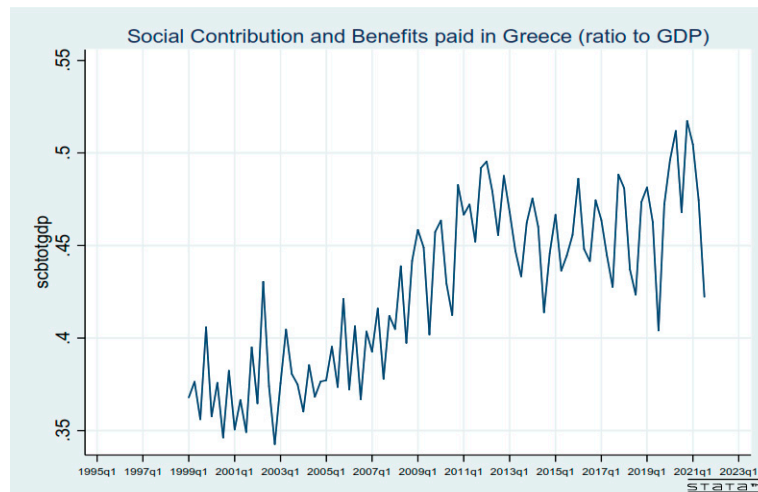
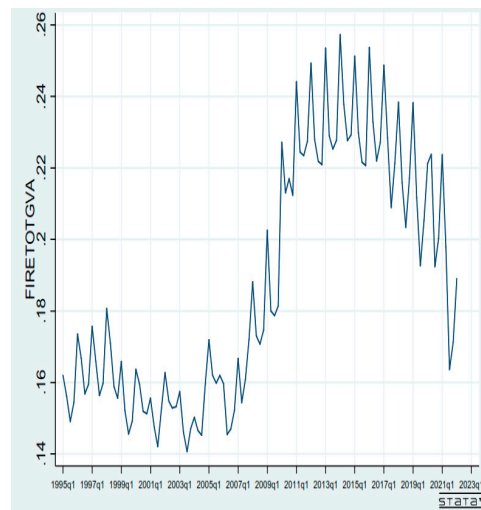
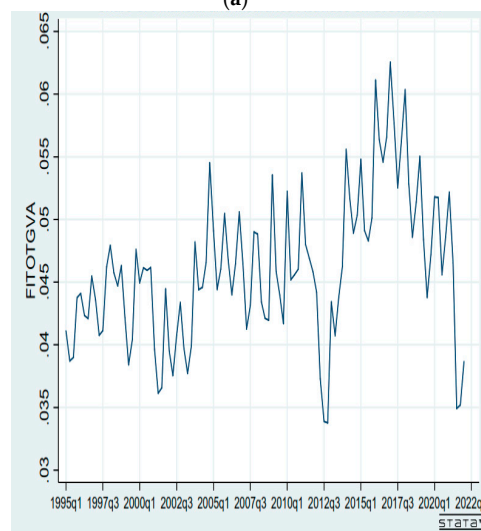


Figure A1. Social Contribution and Benefits Paid in Greece (ratio to GDP).



(a)



(b)

Figure A2. (a) Share of Financial, Insurance and Real Estate Activities to GVA to Greece. (b) Share of Financial and Insurance Activities on Greek GVA.

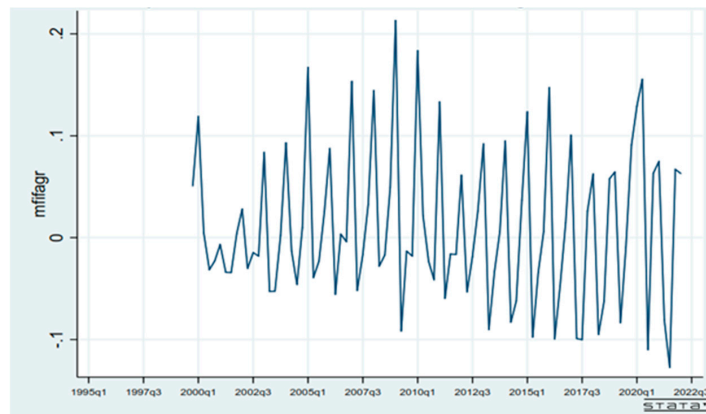
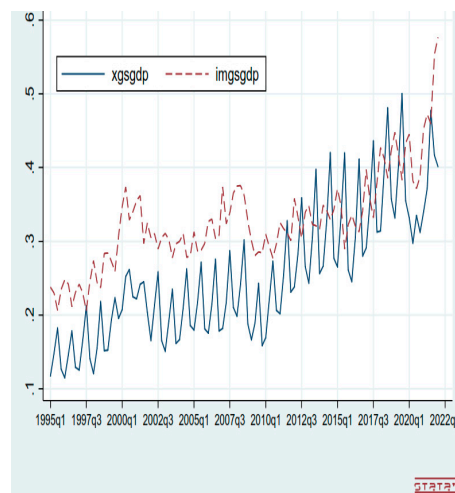
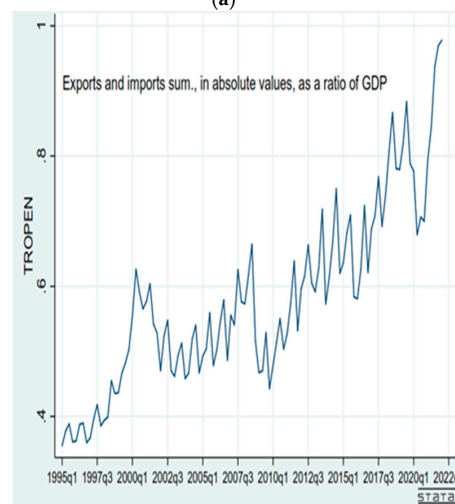


Figure A3. Monetary & Financial Institutions Financial Assets Growth Rate in Greece.



(a)



(b)

Variable	Obs	Mean	Std. Dev.	Min	Max
tropen	109	.5798276	.1410148	.3551854	.9781391
xgsgdp	109	.2528096	.0887268	.1147174	.5004833
imgsgdp	109	.327018	.0654578	.2060502	.5767028

Figure A4. (a) Greek Exports and Imports of Goods and Services as a ration to GDP. (b) Trade Openness of Greece.

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