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Impact assessment of high inflation on Greek public finances. Does the type of inflation matter? Evidence from a highly indebted country*

By Sophia Lazaretou and George Palaiodimos
Bank of Greece

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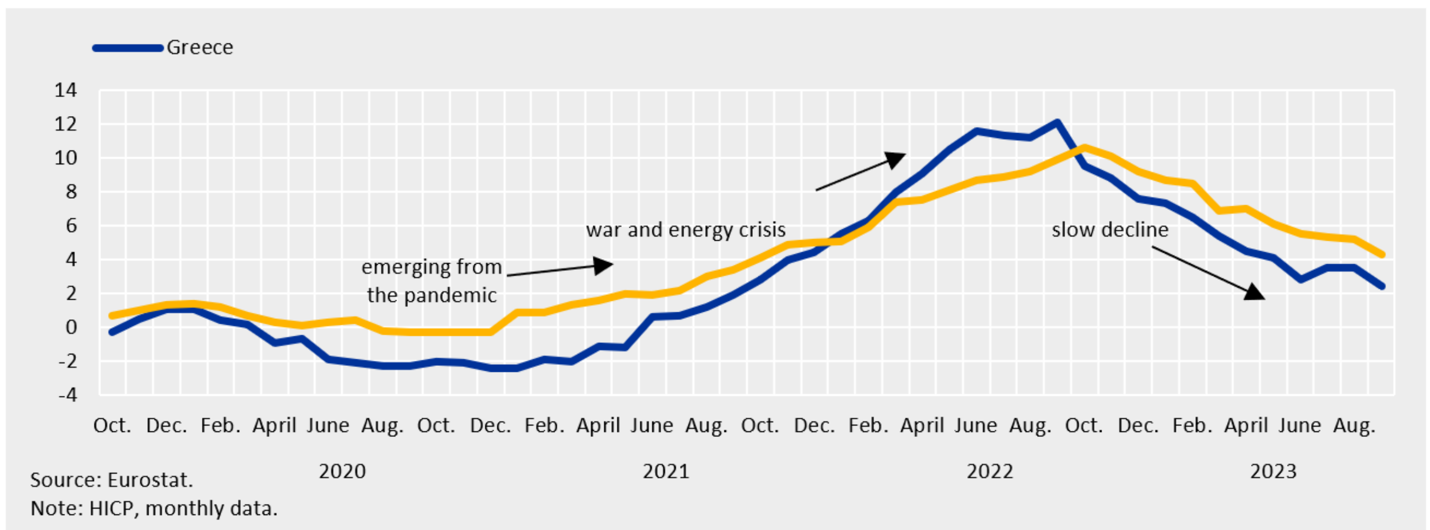
In 2022, the global cost of living surged, pushing already rising global inflation to multi-decade highs. Our empirical analysis assesses the impact of high inflation on Greece's public finances (in terms of flows), considering the extraordinary economic circumstances arising from the pandemic crisis and the initial phase of the recent energy crisis. To this end, we use a small-scale Bayesian vector autoregressive model for the Greek economy to quantify the effects of an adverse price shock on the primary balance, tax revenue and primary spending (all normalised by nominal GDP), as well as on real output, distinguishing between the effects of a demand- and an external supply-driven shock to inflation. We find that the nature of an inflation shock, i.e. whether it is demand- or supply-driven, is important for correctly identifying the short-to-medium-term effects of inflation shocks on fiscal outcomes.

*This policy brief summarizes the main findings of a recently published paper: S. Lazaretou and G. Palaiodimos (2023), "An assessment of the impacts of inflation on Greek public finances: Macroeconomic effects and policy implications", Bank of Greece Economic Bulletin, https://doi.org/10.52903/econbull20235701. The views expressed here are of the authors and do not necessarily reflect those of the Bank of Greece. Any remaining errors and omissions are solely ours.

In 2022, the global cost of living surged, pushing already rising global inflation to multi-decade highs. Before the war in Ukraine, as EU countries were emerging from the pandemic, headline inflation, despite being on the rise, remained subdued (see Chart 1). Inflationary pressures were perceived as temporary, as they resulted from the supply-demand mismatches caused by pandemic-related supply shortages, temporary global trade disruptions and pent-up demand, especially for services. However, geopolitical confrontations, economic fragmentation and more frequent and destructive climate-related natural disasters are unprecedented supply-driven shocks that push up price inflation for energy, food and industrial commodities, feeding into headline inflation. In particular, in the euro area and Greece, taming down inflation will take some time as food-related and core inflation prove to be persistent, mainly due to the lagged pass-through effect of falling energy prices.

Chart 1 Inflation in the euro area and Greece (October 2019-September 2023)

(annual percentage changes)



Source: Eurostat.
Note: HICP, monthly data.

In our new analysis (see Lazaretou and Palaiodimos 2023), we assess the potential impact of high inflation on Greek public finances. Four key factors underpin our focus on Greece. First, accelerating nominal GDP growth in 2022 led to a reversal of the so-called snowball effect. Indeed, in 2022, inflation had the largest positive contribution to the fall of the Greek public debt-to-GDP ratio (exceeding 14 pps of GDP). Second, public debt remains elevated relative to the country's nominal output, thus making debt sustainability sensitive to increases in borrowing rates. Third, so far the Greek government has embarked on an exceptionally bold package of financial support measures aimed at supporting households and businesses against the energy crisis and rising inflationary pressures. Fourth, before entering the euro area, Greece traditionally faced long-lasting demand-driven inflationary pressures and strong inflation expectations (Kalyvitis and Lazaretou 1997; Gibson and Lazaretou 2001; Hondroyiannis and Lazaretou 2007).

The literature on the impact of high inflation on public finances is abundant (see, for example, CEPR 2022). The starting point was the well-known Phelps effect (1973). Its key idea is that, in order to alleviate the burden of distortionary taxation, governments have the option to rely on monetary financing. Rogoff (2010), Blanchard *et al.* (2010), di Bartolomeo *et al.* (2015) and, more recently, Heer *et al.* (2020) and Wickens (2022) examine how a positive and non-negligible inflation rate might be an optimal choice from a public finance point of view.

How inflation affects fiscal variables?

The main channel through which inflation interacts with primary balance is through its impact on nominal tax revenue. By raising nominal GDP, it also makes it easier, other things being equal, to repay public debt, whose profile has not changed.

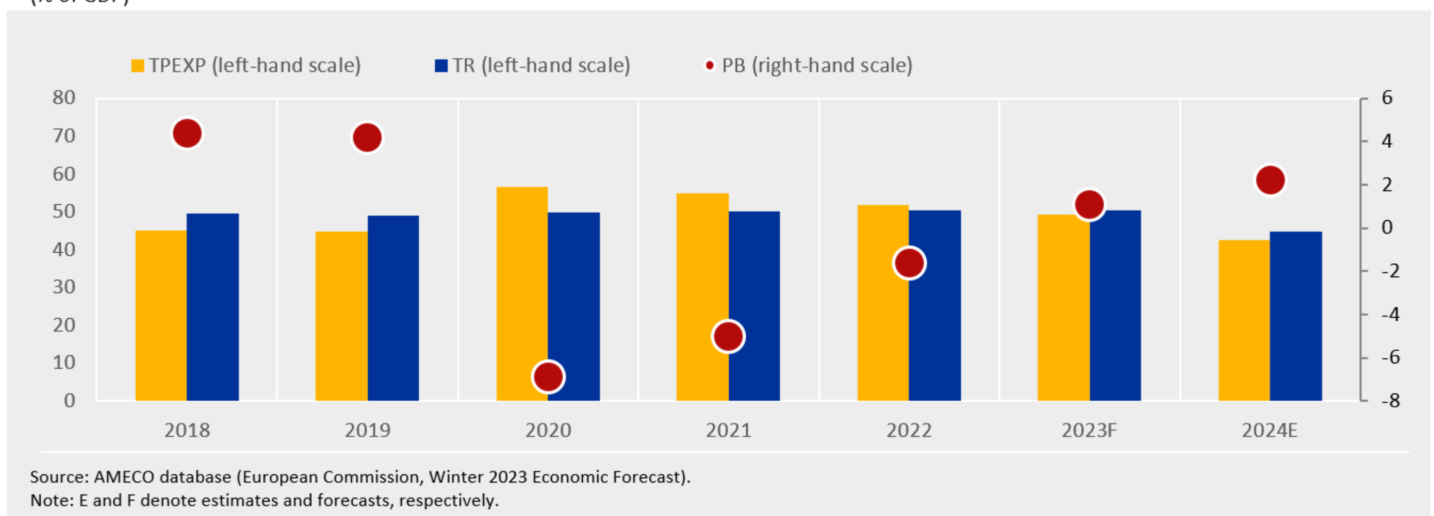
Generally speaking, direct effects include the effects of indexing the parameters of the taxation system (e.g. tax thresholds) and the impact on nominal tax bases. Indirect effects are mainly portrayed in the medium-to-long run and capture the potential deterioration of economic and financial conditions. Nevertheless, the overall impact depends on the origin of inflation. If inflation is linked to a swift rebound in aggregate demand, tax bases increase not only nominally, but also in real terms, and public finances (expressed in levels) tend to improve. Conversely, if inflation is linked to a supply shock, then prices and nominal incomes rise, while real GDP, real disposable income and real consumption shrink, resulting in a tax revenue decline due to a decrease in the tax basis in real terms.

Since government primary spending is only partially indexed, tax revenue increases faster than primary spending and, thus, the primary balance improves. In the long run, however, as expenditure items are gradually indexed, this positive effect may dissipate.

Yet, when fiscal variables are expressed as a percentage of nominal GDP, the results become more dubious as the "denominator" effect may prevail, leading to a deterioration in the respective ratios. As shown in Chart 2, starting from 2018 and over a 6-year horizon, despite the significant windfall collected in 2022 and part of 2023, the ratio of Greek tax revenue to GDP remains almost unchanged, while the ratio of primary spending declines, which, aside from the unwinding of support measures, entails a strong "denominator" effect.

Chart 2 Evolution of total tax revenue (TR), primary government spending (TPEXP) and primary balance (PB) since 2018

(% of GDP)



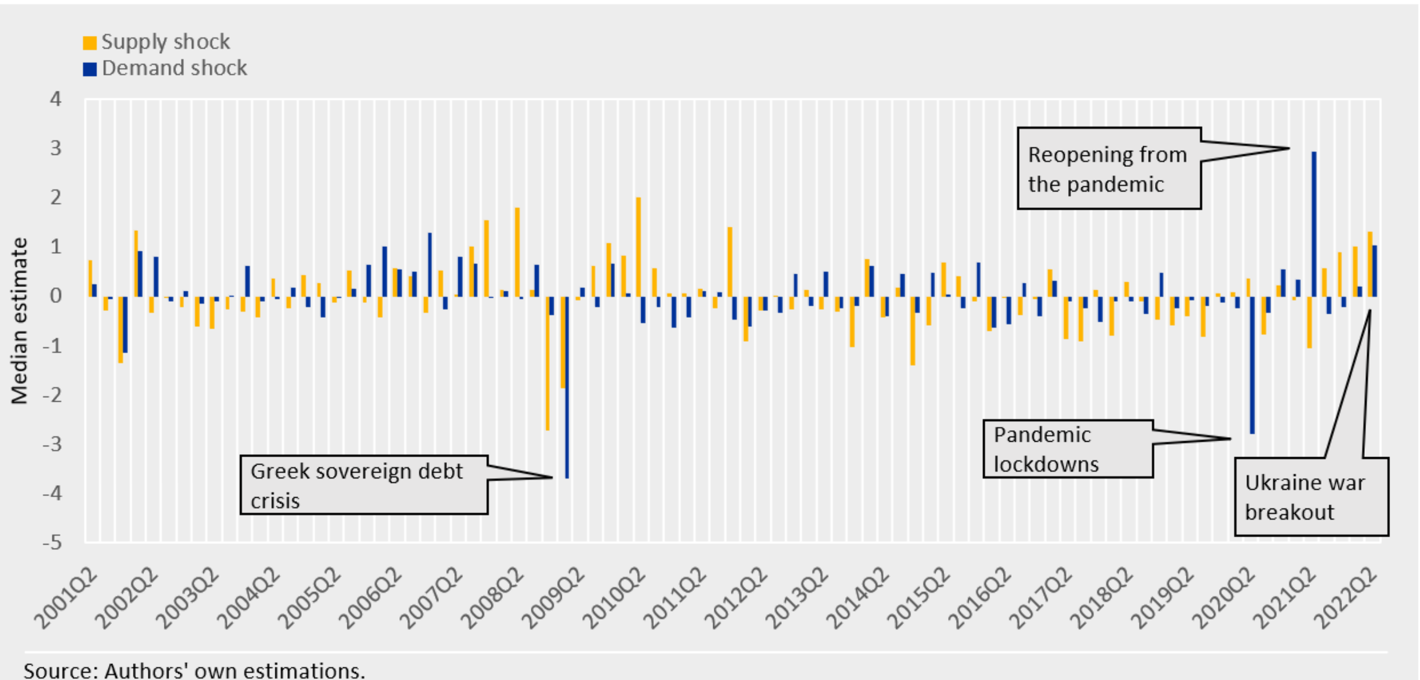
Source: AMECO database (European Commission, Winter 2023 Economic Forecast).
Note: E and F denote estimates and forecasts, respectively.

Empirical results

Using a standard small-scale Bayesian vector autoregression model for the Greek economy over the period from 2000Q1 to 2022Q2, we quantify the effects of inflation shocks on primary spending, tax revenue and the primary balance. All variables in question are expressed as percentages of GDP in an attempt to also capture the impact of the "denominator" effect. Our counterfactual analysis, by means of sign restrictions (see Shapiro 2022 and Jump and Kohler 2022), considers the effects of an external supply-side and a demand-side inflation shock (see Chart 3) on both fiscal variables and real output growth, in the presence of a "responsive" monetary policy stance.

Chart 3 Illustration of demand- and supply-side shocks to price inflation

(%)

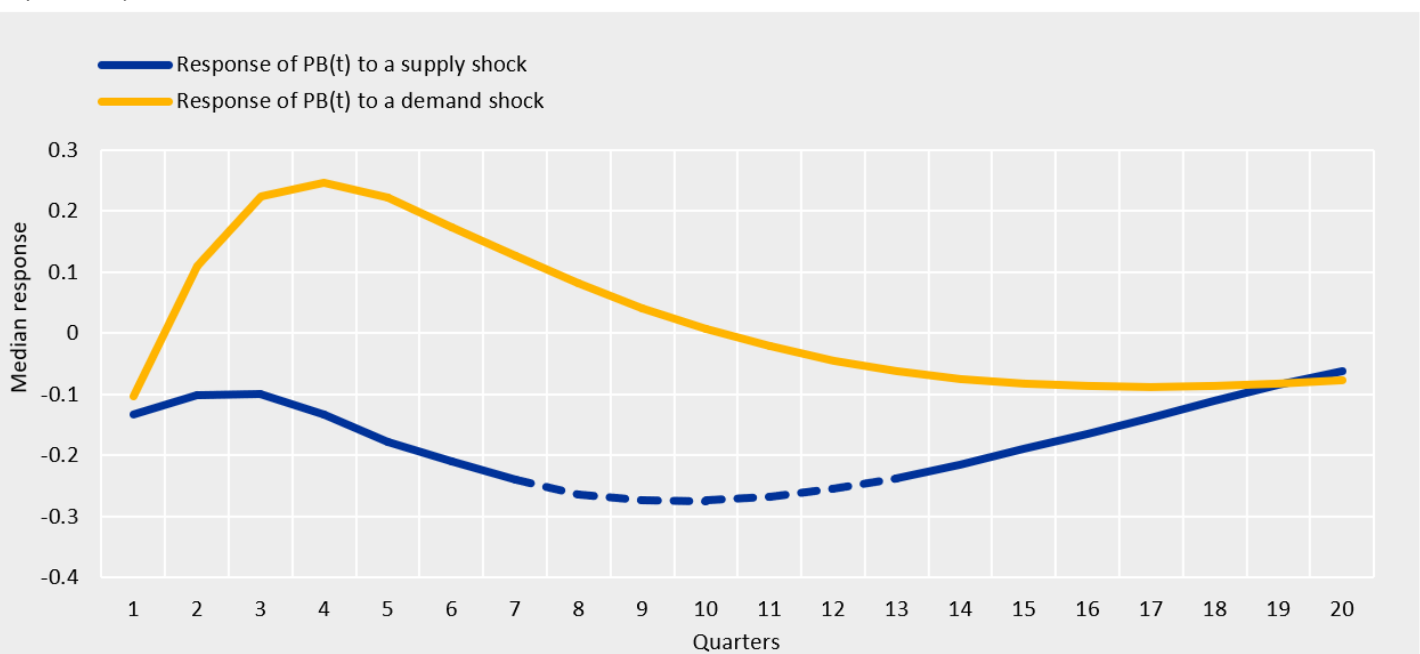


Source: Authors' own estimations.

We find that a *supply-side shock to inflation*, despite its insignificant short-term impact on the ratio of primary balance, leads to a medium-term (after 4-5 quarters) deterioration, which reflects the decline in the ratio of tax revenue, stemming from the estimated adverse effect on real output growth (see Charts 4 and 5a). In the case of a *demand-driven shock to inflation*, no significant effect is found on the ratio of primary balance either in the short or in the medium run. The key driver behind this type of inflation shock is the dominant "denominator" effect that leads to parallel declines in both the ratios of tax revenue and primary spending (see Chart 5b).

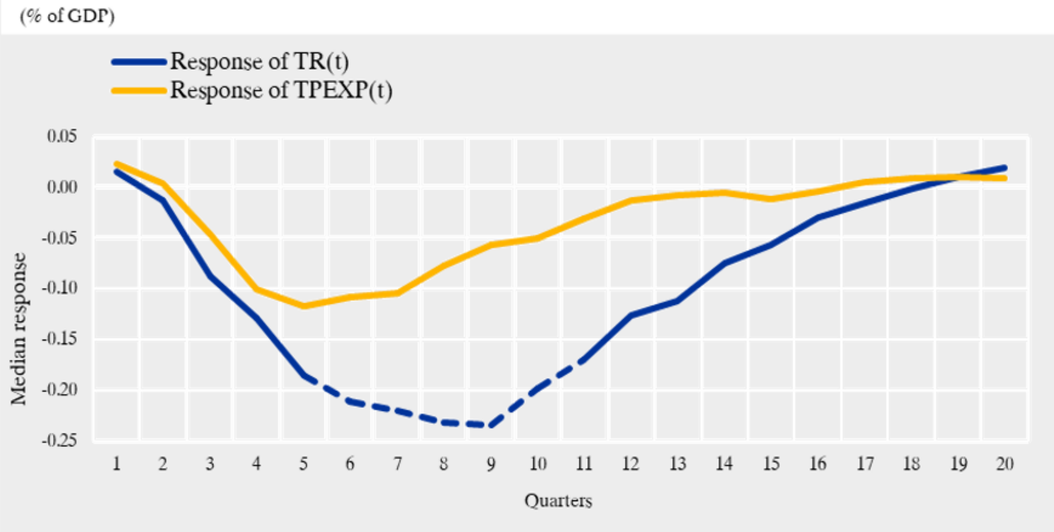
Chart 4 Impulse response functions of primary balance (PB) in the case of a demand-side and an external supply-side shock to price inflation

(% of GDP)



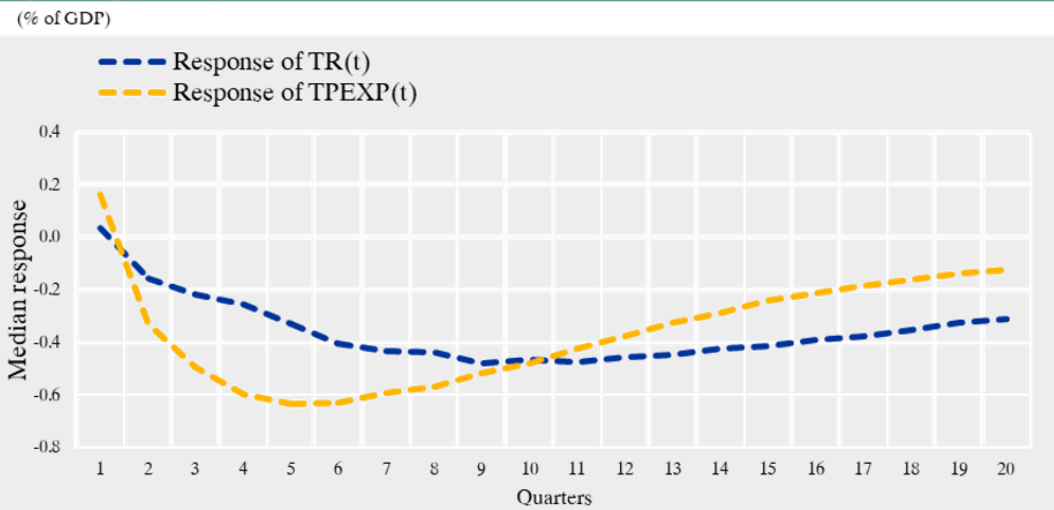
Source: Authors' own estimations.
Note: Dashed lines denote statistical significance at the 68% level.

Chart 5a Impulse response functions of total tax revenue (TR) and primary government spending (TPEXP) in the case of an external supply-side shock



Source: Authors' own estimations.
Note: Dashed lines denote statistical significance at the 68% level.

Chart 5b Impulse response functions of total tax revenue (TR) and primary government spending (TPEXP) in the case of a demand-side shock



Source: Authors' own estimations.
Note: Dashed lines denote statistical significance at the 68% level.

In conclusion, empirical evidence from Greece points out that in the presence of a negative supply-side shock, fiscal sustainability analysis needs to consider the significant medium-term downside risks associated with the adverse effect of inflation on the ratios of key fiscal variables. That said, the main policy implication of the analysis is that an evidence-based view of the typology of inflation shocks is important for properly assessing their short-to-medium-term effects on fiscal outcomes, as well as on debt sustainability *per se*.

References

Blanchard, O., G. Dell' Ariccia and P. Mauro (2010), "Rethinking macroeconomic policy", IMF Staff Position Note No. 2010/03.

CEPR (2022), "Inflation and Europe's public finances", *VoxEU Talk*, 24 June.

Di Bartolomeo, G., P. Tirelli and N. Acocella (2015), "The comeback of inflation as an optimal public finance tool", *International Journal of Central Banking*, 11(1), 43-70.

Gibson, H. and S. Lazaretou (2001), "Leading inflation indicators in Greece", *Economic Modelling*, 18(3), 325-348.

Heer, B., V. Polito and M. R. Wickens (2020), "Population aging, social security and fiscal limits", *Journal of Economic Dynamics and Control*, 116, July: 103913.

Hondroyiannis, G. and S. Lazaretou (2007), "Inflation persistence during periods of structural change: an assessment using Greek data", *Empirica*, 34(5), 453-475.

Jump, R.C. and K. Kohler (2022), "A history of aggregate demand and supply shocks for the United Kingdom, 1900 to 2016", *Explorations in Economic History*, 85, July: 104448.

Kalyvitis, S. and S. Lazaretou (1997), "Persistence of nominal and real variables under fixed and floating exchange rates: Evidence from Greece, 1954-1992", *Bulletin of Economic Research*, 49(2), 153-168.

Lazaretou, S. and G. Palaiodimos (2023), "An assessment of the impacts of inflation on Greek public finances: Macroeconomic effects and policy implications", *Economic Bulletin*, Bank of Greece, 57, 7-30, July, https://doi.org/10.52903/econbull20235701.

Phelps, E. (1973), "Inflation in the theory of public finance", *Swedish Journal of Economics*, 75(1), 67-82.

Rogoff, K. (2010), "Why America isn't working?", *Project Syndicate*, September, https://www.project-syndicate.org/commentary/why-america-isn-t-working.

Shapiro, A.H. (2022), "Decomposing supply and demand driven inflation", Federal Reserve Bank of San Francisco, Working Paper 2022-18, https://www.frbsf.org/wp-content/uploads/sites/4/wp2022-18.pdf.

Wickens, M.R. (2022), "How might the UK's Debt-GDP ratio be reduced? Evidence from the last 120 years", CEPR Discussion Paper DP 17172, https://repec.cepr.org/repec/cpr/ceprdp/DP17172.pdf.

About the authors

Sophia Lazaretou *works as Senior Economist-Researcher in the Economic Analysis and Research Department of the Bank of Greece since 1997. She was Lecturer and Assistant Professor of International Monetary Economics at the University of Macedonia (1993–1997, at Thessaloniki Greece), Research Fellow at the Athens Centre of Economic Research (1996–1998), visiting Professor of Macroeconomics at the University of Crete (1993–1994) and at the Hellenic Open University (2005–2007). She holds a Ph.D. in International Monetary Economics (1993) from the Athens University of Economics and Business and the European University Institute (EUI, Florence, Jean Monett Researcher, 1992–1993). She has published many papers in international academic journals such as Explorations in Economic History, Empirica, Economic Modelling, Comparative Economic Studies, Economic Notes, Bulletin of Economic Research, Corporate Governance, Managerial and Decision Economics, among others. She has been awarded by the Athens Academy of Sciences (Section of Ethical and Political Sciences Award for the year 2002). https://www.researchgate.net/profile/Sophia-Lazaretou.*

George Palaiodimos *is a research economist with his areas of interest involving International Economics, fiscal and monetary policy, and Econometrics. He was Lecturer at Panteion University (2012-2015) and Research Assistant at the Centre of Planning and Economic Research (KEPE) (2001–2003). His professional experience involves the Greek Ministry of Finance as the Head of Minister's Cabinet (2009-2012), the Bank of Greece (2012-2015), the European Central Bank in Frankfurt (2015-2017) and the European Stability Mechanism in Luxembourg (2017-2021). He holds a Ph.D. in International Economics (2010) from the Athens University of Economics and Business. He has published series of papers in international academic peer reviewed journals.*

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SUERF Secretariat
c/o OeNB
Otto-Wagner-Platz 3
A-1090 Vienna, Austria
Phone: +43-1-40420-7206
www.suerf.org • suerf@oenb.at