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Research Article

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Theoretical Modeling of Macroeconomic Stability under Austerity: The Roles of FDI, Consumption Volatility, and Wage Financing

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ABSTRACT

This study examines the persistence of investment in a closed economy under austerity conditions, focusing on the interaction between foreign direct investment (FDI), public expenditures, and payroll financing. We develop a dynamic model where investment volatility follows a FIGARCH process, capturing long-memory effects, while household consumption and investment interact through adaptive expectations. Policy implications suggest that strategic fiscal interventions can mitigate the adverse effects of economic contractions, supporting long-term investment flows and financial stability.

JEL Classification: E62, H63, H68, C58, G32

Keywords: Investment Volatility, Austerity Policies, Economic Dynamics, Fiscal Policy Analysis

Introduction

Periods of fiscal austerity present complex challenges for economies reliant on both foreign direct investment (FDI) and stable household consumption. Austerity policies, by design, contract public spending and aggregate demand, yet their broader impact on long-term investment behavior and labor market stability remains insufficiently understood [1]. This paper seeks to address this gap by proposing a theoretical framework that captures the dynamic interactions between FDI persistence, consumption volatility, and payroll financing during fiscal consolidation phases.

Our approach draws on established findings regarding investment behavior under macroeconomic uncertainty and the role of consumption in sustaining growth trajectories [2-4]. Building on these insights, we introduce a model where FDI dynamics are not only influenced by contemporaneous consumption patterns but also exhibit significant memory effects, consistent with the observed persistence of capital flows over time [5,6]. To accurately represent the volatility inherent in investment decisions during austerity periods, we model investment shocks using a Fractionally Integrated Generalized Autoregressive Conditional Heteroskedasticity (FIGARCH) process, following methodologies that emphasize long-memory properties in financial series [7,8].

Beyond capturing the intertemporal behavior of FDI and consumption, the framework incorporates a critical macroeconomic dimension often overlooked in the literature: the financing of labor force wages under conditions of fiscal constraint. By explicitly modeling the interaction between investment inflows and public expenditures in payroll financing, we provide a novel perspective on how economies can sustain employment levels while navigating austerity-induced budgetary pressures [9].

This theoretical model, therefore, not only advances the understanding of investment and consumption dynamics under austerity but also offers practical policy insights into balancing public and private contributions to economic stabilization. In doing so, it contributes to ongoing debates surrounding the design of fiscal consolidation strategies that safeguard long-term growth and labor market resilience [10].

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Model and Methodology

The objective of this section is to describe the methodological framework employed in our study of austerity conditions and their impact on foreign direct investment (FDI) and household consumption. Our model captures the dynamic interplay between FDI persistence and consumption volatility during periods of fiscal constraint. This study builds upon the literature on investment behavior under macroeconomic instability and the role of consumption in growth sustainability [1,2]. By incorporating a Fractionally Integrated Generalized Autoregressive Conditional Heteroskedasticity (FIGARCH) model for investment volatility, we provide a refined approach to analyzing the relationship between austerity policies and investment resilience.

Theoretical Model

We model foreign direct investment I_s and household consumption C_s using the following system of equations

$$I_s = I_{s-1} + \hat{g}C_s + h_t \in_s$$
$$C_s = (1-\alpha)C_{s-1} + \in_s$$

where:

- I_s represents foreign direct investment (FDI) at time s.
- C_s denotes household consumption at time s.
- $\hat{g}$ is the marginal impact of consumption on FDI.
- α captures the persistence of consumption.
- $\in_s$ represents an idiosyncratic consumption shock.
- h_t captures time-dependent heteroskedasticity effects in investment.

During austerity conditions, consumption contracts due to restrictive fiscal policies, leading to lower demand. However, FDI exhibits a short memory, meaning past investment levels significantly influence future investment decisions. This assumption aligns with the findings of Alfaro et al., who argue that FDI flows are driven by historical capital inflows and macroeconomic stability [3]. The presence of adaptive expectations in investment decisions is consistent with Dunning's OLI paradigm, which suggests that foreign investors consider past investments as indicators of future profitability [4].

Equilibrium Condition

To ensure an equilibrium between austerity policies and the need for FDI inflows, we impose the following condition:

$$E^H[I_T/F_t] = \alpha I_t$$

where:

- $E^H[\cdot]$ denotes the expectation operator under a high-order filtering process.
- F_t represents the available information set at time t.
- $\alpha \approx 1$ ensures near-unit investment persistence.

This assumption maintains a self-reinforcing mechanism where past FDI inflows continue to attract new investments, despite the contractionary effects of austerity. The marginal propensity to invest is therefore given by:

$$\hat{g} = \frac{(\alpha - 1) I_t}{\sum_{i=t+1}^{T} C_i}$$

This formulation accounts for the fact that foreign investors may require sustained levels of consumption to justify continued investment, balancing the adverse effects of fiscal retrenchment.

Statistical Approach: FIGARCH(1,d,1) Specification for Investment Volatility

Investment volatility, which plays a central role in the model, is assumed to follow a FIGARCH(1,d,1) process, extending the conventional GARCH model to capture long memory effects [5]:

$$h_t = \omega + \left(1 - \sum \phi_i L^i\right)^{-d} \left(1 - \sum \beta_j L^j\right) \in_t^2$$

where:

- h_t is the conditional variance of investment shocks.
- L is the lag operator.
- d is the fractional differencing parameter capturing long-term persistence in volatility.
- ϕ_i and β_j are model parameters.

This specification captures the persistence of shocks to investment volatility, reflecting the cumulative nature of FDI over time, particularly during austerity periods. The long-memory property of the FIGARCH process ensures that past volatility affects future investment decisions, a key characteristic observed in capital flows [6]. By modeling investment volatility in this way, we align with empirical research indicating that macroeconomic uncertainty influences foreign investors' risk perceptions and capital allocation strategies [7].

Payroll Financing through Investments and Public Expenditures

A critical aspect of macroeconomic stabilization during austerity periods is the financing of the labor force's payroll. Given the contractionary effects of fiscal policies, we propose a model that links payroll financing to both foreign direct investment (FDI) and public expenditures. Specifically, we define the total payroll at time t as:

$$Lw_t = I_t + a(t,T)G_t$$

where:

- L represents the number of employed workers.
- w_t denotes the average wage at time t.
- I_t is foreign direct investment at time t, contributing to labor financing.
- G_t is the level of public expenditures allocated to payroll.
- $a(t,T)$ is a dynamic allocation coefficient, ensuring a balance between investment and government-funded payroll.

To enforce a fair distribution of payroll financing between investments and public expenditures by the end of the austerity period, we impose the terminal condition:

$$a(T,T) = 1$$

which ensures that, at the end of the period, payroll is entirely financed through a well-balanced combination of investment and public funds.

Expected Condition and a Numerical Solution for the Payroll

Given that payroll financing follows a dynamic allocation mechanism, we assume that its expectation under the probability measure Q satisfies:

$E^{Q}[Lw_t/F_t] = G_t$

where:

- $E^{Q}[\cdot /F_t]$ denotes the expected value under a measure Q, conditioned on information available at t.
- $b(t,T)$ is a time-dependent function governing the expected reliance on public expenditures.

This assumption leads to the following fundamental equilibrium equation:

$$E^{Q}\left[a(T,T)G_T + \sum_{i=t+1}^{T} \hat{g}C_i / F_t\right] + I_t = b(t,T)G_t$$

where $E^{Q}[\cdot /F_t]$ represents the expectation under the historical probability measure Q.

Savings and Long-Run Investment Equilibrium

In the post-austerity phase, we assume that national savings s_t are directed toward financing investment as well as covering any remaining portion of payroll that public expenditures could not finance. This is represented as:

$s_t = (b(t, T) - 1)G_t + I_t$

which suggests that, in the long run, as austerity policies ease, public expenditures should progressively cover the entire payroll. Consequently, we establish the long-run equilibrium condition:

$E[s_T/F_t] = I_T$

implying that, over time, savings are fully channeled into investment, and the government is able to independently sustain the payroll. This leads to the final equilibrium expression:

$$E[IT / Ft] = \left(\frac{a(T,T)}{a(T,T) - b(T,T) + 1}\right)\left(I_T - \frac{\left(b(T,T) - 1\right)}{a(T,T)} b(t,T) G_t\right)$$

This formulation establishes a direct link between long-term investment expectations and the ability of public expenditures to progressively take over payroll financing, reinforcing macroeconomic stability. By ensuring that investment dynamics remain consistent with savings trends, we provide a framework where austerity-induced consumption contractions do not lead to structural distortions in employment financing.

Economic Interpretation and Policy Implications

The proposed framework highlights the role of investment persistence in maintaining labor market stability during fiscal consolidation. The interaction between public expenditures and FDI in payroll financing is crucial in ensuring a smooth transition out of austerity. Our model suggests that policymakers should carefully calibrate $a(t, T)$ and $b(t, T)$ to avoid excessive reliance on either investment or public expenditures alone, promoting a balanced distribution of payroll financing sources.

In summary, this model contributes to the literature on fiscal policy and investmentled growth by integrating labor market dynamics with macroeconomic stability conditions. By incorporating a forward-looking approach to payroll financing, we provide a foundation for analyzing long-term equilibrium conditions in economies undergoing austerity-driven structural adjustments.

Conclusion and Future Research Directions

The model highlights that, even under restrictive fiscal policies, investment resilience and balanced payroll financing are achievable through a careful coordination of consumption dynamics and forward-looking expectations about public sector contributions. Furthermore, the persistence of FDI inflows, reinforced by historical capital accumulation patterns, plays a crucial role in mitigating the contractionary effects of austerity on employment and aggregate demand. The theoretical equilibrium conditions derived herein offer a foundation for evaluating policy interventions aimed at safeguarding growth trajectories without jeopardizing fiscal discipline.

While this study lays the groundwork for understanding critical dynamics in austerity contexts, several avenues for future research emerge. First, empirical validation of the model using panel data across economies that have experienced austerity episodes would enhance its practical relevance and allow for the calibration of key parameters such as the marginal propensity to invest and the dynamics of public-to-private payroll financing. Second, extensions of the model could incorporate sectoral heterogeneity, acknowledging that FDI and consumption responses may vary across industries and labor markets. Third, integrating sovereign risk and interest rate dynamics into the framework would provide a richer representation of the fiscal constraints faced by governments during consolidation phases.

Finally, future theoretical work could explore the interaction between austerity policies and monetary interventions, particularly the extent to which accommodative monetary policy can amplify or offset the effects modeled herein. Such extensions would contribute to a more comprehensive understanding of the policy mixes best suited to navigating the trade-offs between fiscal responsibility, investment sustainability, and labor market resilience.

Declarations and Standards

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All authors read and approved the final manuscript.
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References

1. Alesina A, Ardagna S. Large changes in fiscal policy: Taxes versus spending. In Tax policy and the economy. University of Chicago Press. 2010. 24: 35-68.
2. Bernanke BS. Irreversibility, uncertainty, and cyclical investment. Quarterly Journal of Economics. 1983. 98: 85-106.
3. Dixit AK, Pindyck RS. Investment under uncertainty. Princeton University Press. 1994.
4. Hall RE. Stochastic implications of the life cycle-permanent income hypothesis: Theory and evidence. Journal of Political Economy. 1978. 86: 971-987.
5. Alfaro L, Chanda A, Kalemli-Ozcan S, Sayek S. FDI and economic growth: the role of local financial markets. Journal of International Economics. 2004. 64: 89-112.
6. Dunning JH. The eclectic paradigm of international production: a restatement and some possible extensions. Journal of International Business Studies. 1988. 19: 1-31.
7. Baillie RT, Bollerslev T, Mikkelsen HO. Fractionally integrated generalized autoregressive conditional heteroskedasticity. Journal of Econometrics. 1996. 74: 3-30.
8. Bollerslev T, Mikkelsen HO. Modeling and pricing long memory in stock market volatility. Journal of Econometrics. 1996. 73(1), 151-184.
9. Guajardo J, Leigh D, Pescatori A. Expansionary austerity? International evidence. Journal of the European Economic Association. 2014. 12: 949-968.
10. Blanchard O, Leigh D. Growth forecast errors and fiscal multipliers. American Economic Review. 2013. 103: 117-120.