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An Empirical Assessment of Economic Growth and Income Inequality. The Case of European Emerging and Advanced Countries

Thèse de doctorat en cotutelle internationale présentée et soutenue publiquement pour l'obtention du titre de Docteur en Sciences Economiques

par

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Abstract

The thesis entitled *"An Empirical Assessment of Economic Growth and Income Inequality. The Case of European Emerging and Advanced Countries"* explores the complex relationship between income inequality and economic growth in Europe, with a focus on contrasts between former communist and non-communist nations. By examining a range of socioeconomic and institutional factors such as education, trade openness, poverty, and financial development, the research presents three empirical studies offering novel insights into this debated topic.

The first paper revisits the inequality-growth connection in Central and Eastern Europe, uncovering a general trend where economic growth reduces inequality over the long term, supported by the roles of human capital and trade. Short-term variations occur, with some nations showing inverted-U dynamics while others exhibit insignificant linear patterns. These findings highlight the importance of region-specific policies to manage post-transition challenges effectively.

The second study investigates the poverty-growth-inequality triangle in 26 EU countries, revealing disparities in how regional inequality evolves despite global reductions in income inequality. Positive shocks to GDP and inequality drive widening income gaps over time. In the Eurozone, monetary policies disproportionately benefit wealthier households, while redistributive efforts are less impactful in non-Euro countries. These outcomes call for tailored fiscal strategies that address regional vulnerabilities, especially among low-income groups.

The third study assesses how financial development influences inequality and growth in Romania. The analysis shows that financial expansion tends to increase income disparities, with market liberalization contributing more to inequality than institutions' behaviour. Inflation intensifies this effect, thus strategies to stabilize financial markets and control inflation are recommended to minimize adverse impacts on vulnerable households.

General key recommendations include fostering GDP growth, improving institutional quality, and enhancing financial literacy while tackling poverty and inflation.

Keywords: income inequality, economic growth, poverty triangle, financial development, Europe, dynamic heterogeneous panels

Introduction

Economic growth and income inequality are central to macroeconomic debates due to their policymaking and social welfare implications. Influential theories posit a complex, non-linear relationship between these two variables, such as Kuznets' (1955) inverted U-shaped hypothesis and Kaldor's (1956) savings model. Kuznets suggests that growth initially increases inequality, driven by structural labour shifts from agriculture to industry, but later reduces it as economies mature, while Kaldor emphasizes that higher savings and investment by wealthier individuals can fuel growth.

Over time, global trends in inequality have varied, shaped by policies, globalization, and technological change. More precisely, recent decades have witnessed renewed interest in understanding the growth-inequality nexus due to rising concerns about the social, economic, and political implications of widening income gaps. Different global and regional crises have exacerbated these disparities, making this issue critical for sustainable development.

In this regard, **Europe** provides a unique framework for studying this relationship, given its socioeconomic diversity, regional integration, and historical transitions from centrally planned to market systems. As a result of the considerations outlined above, several key research questions emerge: What is the relationship between economic growth and income inequality in Europe? Does the Kuznets Curve apply in this context? And what are the transmission channels that shape this linkage?

Despite extensive research on the growth-inequality nexus, findings are inconclusive and contrary, especially in European countries. Motivated by increasing regional inequality trends and heterogeneous patterns, this thesis aims to explore this relationship by addressing **three specific research questions**:

1. How does economic growth influence income inequality in Central and Eastern Europe? Is the Kuznets Curve valid in this framework?

2. What role does poverty play in the inequality-growth link across EU countries?

3. How does financial development impact inequality and growth in Romania?

As **objectives,** this thesis seeks to examine through three original papers how economic growth influences income inequality, first through a basic specification and subsequently under varying conditions, incorporating different socioeconomic factors as transmission channels.

The first paper, entitled "Economic Growth and Income Inequality: The Challenge in Ex-Communist EU Countries", addresses the first research question by exploring the relationship between inequality and growth within the Central and Eastern European (CEE) context. This study aims to examine the unique characteristics of former European transition economies, given their shared historical background and diverse development trajectories. Additionally, it tests the validity of Kuznets' inverted-U hypothesis for emerging countries in this sample and evaluates the roles of human capital and international trade as potential transmission mechanisms.

The second paper, entitled "The Future of Income Inequality in the European Union: Do Economic Growth and Poverty Matter?", investigates the subsequent research questions by analyzing the interconnections between poverty, inequality, and economic growth, often referred to as the "Poverty Triangle," across EU member states. This research explores regional variations in these linkages (e.g. Western vs. Eastern Europe, Euro-area vs. non-Euro-area) and identifies channels through which poverty, inequality, and growth interact within specific contexts, such as educational attainment, labor market dynamics, and redistributive and monetary policies.

The third paper, entitled "New Evidence Concerning the Inequality-Financial Development-Economic Growth Nexus in Romania: A Cointegration Approach", delves into the inequality-financial development-growth link in Romania, an ex-communist economy, to answer the last research question. The study investigates the debated impact of financial development on income inequality, assessing whether a long-term equilibrium exists among these variables. It further examines how lower-income deciles respond to increased financial development and considers the role of inflation in shaping the broader relationship.

The contribution and originality of this research consists in offering a comprehensive analysis of inequality and growth interactions across Europe, considering the region's distinct socioeconomic context and a time framework that includes major macroeconomic events (e.g. the transition from communism and EU accession, the Global Financial Crisis, the Eurozone crisis, the COVID-19 pandemic). By complementing the debate on the necessity of macroeconomic policies to tackle income inequality, this thesis underscores the importance of equitable growth strategies. Its findings are expected to provide valuable insights and recommendations for policymakers, particularly within the framework of the EU's ongoing efforts to achieve economic convergence and social inclusion.

Concerning **data and methodology**, data spanning 1990-2021 from sources like the World Bank Databases, Eurostat, World Inequality Database and IMF are used. Methodologies include **panel data analysis** to capture CEE economies' short- and long-term dynamics *(Paper 1)*, investigate causal relationships and impulse-response functions for EU countries *(Paper 2)*, as well as **times series analysis** to examine cointegration and short-term adjustments for Romania *(Paper 3)*. These approaches account for heterogeneity, non-stationarity, and cross-sectional dependence to ensure robust results.

This thesis comprises **three original papers** organized as independent manuscripts that study the inequality-growth nexus from different perspectives:

SUMMARY OF PAPER 1 "ECONOMIC GROWTH AND INCOME INEQUALITY: THE CHALLENGE IN EX-COMMUNIST EU COUNTRIES"

The first research paper revisits the linkage between economic growth and income inequality in 11 CEE countries from 1994 to 2020 using the Pooled Mean Group (PMG) estimator of Pesaran, Shin and Smith (1999). By employing a quadratic model, it tests the validity of the Kuznets Curve and evaluates the influence of human capital and international trade. General findings reveal a monotonically decreasing relationship between growth and inequality in the long-term, with significant variations in the short-term, cross-country-dependent. Human capital and trade openness are significant in reducing disparities, while country-specific factors like corruption control and institutional quality also contribute. The analysis further highlights the post-transition challenges faced by CEE economies, emphasizing their gradual convergence with Western European standards. However, persistent income gaps necessitate appropriate policy interventions. In this regard, policy recommendations stress enhancing education, improving foreign trade collaborations, and addressing tailored policy actions to mitigate the existent heterogeneity between countries.

SUMMARY OF PAPER 2 "THE FUTURE OF INCOME INEQUALITY IN THE EUROPEAN UNION: DO ECONOMIC GROWTH AND POVERTY MATTER?"

The second paper assesses the poverty-growth-inequality triangle across 26 EU countries from 2000 to 2019, using a GMM-panel vector autoregression approach. It highlights how regional disparities shape this nexus, with distinct dynamics in Western and Eastern Europe, alongside Eurozone and non-Eurozone members. Major results highlight that positive GDP and poverty shocks exacerbate income inequality, especially in wealthier western regions. Moreover, our work investigates how poverty thresholds influence inequality dynamics over time, revealing the need for poverty-alleviating strategies in Europe. Factors like human capital investment and labour occupancy do not seem to play a role in reducing inequality, contradicting the proposed hypothesis, while redistributive fiscal and monetary strategies show varying effectiveness among Euro-area and non-Euro-area members.

SUMMARY OF PAPER 3 "NEW EVIDENCE CONCERNING THE INEQUALITY-FINANCIAL DEVELOPMENT-ECONOMIC GROWTH NEXUS IN ROMANIA"

Focusing on Romania, the third paper investigates the long-term relationship between financial development, economic growth, and income inequality from 1990 to 2021. Employing the ARDL method (Pesaran, 2001), it identifies how financial expansion and inflation disproportionately impact low-income households, widening income disparities. While GDP growth shows no direct influence on inequality at the aggregated level, financial sector inefficiencies and inflationary pressures emerge as critical factors. Furthermore, this study provides a granular analysis of financial institutions and markets, emphasizing their depth, efficiency, and accessibility through the latest financial indicator developed by the IMF (Svirydzenka, 2016), i.e., the Financial Development Index. We also highlight the challenges faced by transition economies in achieving equitable income distribution through financial markets and institutions' development. Policy recommendations include stabilizing financial markets' volatility, enhancing access to credits, and targeting inflation control (as a complementary objective) to reduce income gaps between individuals.

CONCLUSIONS AND FURTHER RESEARCH

To summarize, this thesis tackles the particular case of EU member states observed from 1990 to 2021, collecting data from different sources, as mentioned previously. While the income inequality-economic growth topic represents the priority of this analysis, we also consider the influence of some related primary drivers like human capital, poverty, trade, and stabilization policies, among others. By addressing different transmission channels, our findings highlight significant regional heterogeneities and support targeted interventions to foster sustainable growth and reduce income discrepancies.

Nevertheless, the present study has several **limitations** that should be recognized. These are related to inequality indicators since this research primarily focuses on income inequality derived from wages and does not comprehensively address wealth inequality, which includes assets and financial resources. Also, it is restricted to a quantitative macroeconomic perspective, mainly due to data availability.

Future research could expand by integrating more complex and updated inequality measures (such as wealth, carbon or gender inequality), qualitative variables, and micro-level data to validate and enhance our results. Additionally, exploring the role of technological progress, digitalization and climate policies in shaping inequality could offer new insights.

SELECTED REFERENCES

1. Abrigo M., and Love, I. 2016. ”Estimation of Panel Vector Autoregression in Stata”. *Stata Journal* 16(3):778-804. doi: 10.1177/1536867X1601600314

2. Acemoglu, D., Johnson, S. and Robinson, J. A. 2001. ”The colonial origins of comparative development: An empirical investigation”. *American Economic Review* 91(5): 1369-1401. doi: 10.1257/aer.91.5.1369

3. Acemoglu, D., and Robinson, J.. 2013. *Why nations fail: The origins of power, prosperity and poverty.* 1st ed. New York: Crown Publishing Group. doi: 10.1111/dpr.12048

4. Albanesi, S. 2006. ‘”Inflation and inequality”. *Journal of Monetary Economics* 54(4):1088-1114. doi: 10.1016/j.jmoneco.2006.02.009

5. Alesina, A., Perotti, R. 1996. ”Income distribution, political instability and investment”. *European Economic Review* 40 (6):1203-1228. doi: 10.1016/0014-2921(95)00030-5

6. Andrews, D.W. and Lu, B. 2001. ”Consistent model and moment selection procedures for GMM estimation with application to dynamic panel data models”. *Journal of Economics* 101(1):123-164. doi: 10.1016/S0304-4076(00)00077-4

7. Arellano, M., and Bond, S. 1991. ”Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations.” *Review of Economic Studies* 58 (2): 277-297. doi: 10.2307/2297968

8. Atems, B., and Jones, J. 2015. ”Income inequality and economic growth: a panel VAR approach”. *Empirical Economics* 48: 1541-1561. doi: 10.1007/s00181-014-0841-7

9. Baltagi, B. H. 2021. *Econometric Analysis of Panel Data.* 6th ed. Springer. Accessed 26 June 2021. https://link.springer.com/content/pdf/bfm:978-3-030-53953-5/1.pdf

10. Baltagi, B. H., and Pesaran M. H. 2007. ”Heterogeneity and Cross Section Dependence in Panel Data Models: Theory and Applications: Introduction”. *Journal of Applied Econometrics* 22(2):229-232. Accessed 31 October 2024. https://www.jstor.org/stable/25146515

11. Barro, R. 2000. ”Inequality and growth in a panel of countries.”*Journal of Economic Growth* 5 (1): 5-32. doi: 10.1023/A:1009850119329

12. Berg, A., Ostry, J. D., Tsangarides, C. G. and Yakhshilikov, Y. 2018. ”Redistribution, inequality and growth: new evidence”. *Journal of Economic Growth* 23 (3): 259-305. doi: 10.1007/s10887-017-9150-2

13. Bernard, J.-T., Chu, B., Khalaf, L. and Voia, M. 2019. ”Non-Standard Confidence Sets for Ratios and Tipping Points with Applications to Dynamic Panel Data”. *Annals of Economics and Statistics* 134: 79-108. doi: 10.15609/annaeconstat2009.134.0079

14. Bourguignon, F. 2004. *”The Poverty-growth-inequality triangle”*. New Delhi: Indian Council for Research on International Economic Relations. Accessed 12 June 2023. https://EconPapers.repec.org/RePEc:ind:icrier:125

15. Breitung, J., and Das, S. 2005. ”Panel unit root tests under cross-sectional dependence.” *Statistica Neerlandica* 59 (4): 414-433. doi: 10.1111/j.1467-9574.2005.00299.x

16. Breunig R., Majeed O. 2020. ”Inequality, poverty, and economic growth”. *International Economics* 161:83-99. doi: 10.1016/j.inteco.2019.11.005

17. Brueckner, M., and Lederman, D. 2018. ”Inequality and economic growth: the role of the initial income.” *Journal of Economic Growth* 23 (3): 341-366. doi: 10.1007/s10887-018-9156-4

18. Brzezinski, M. 2017. ”Income inequality and the Great Recession in Central and Eastern Europe.” *Economic Systems* 42 (2): 219-247. doi: 10.1016/j.ecosys.2017.07.003

19. Chen, B.-L. 2003. "An inverted-U relationship between inequality and long-run growth." *Economics Letters* 78 (2): 205-212. doi: 10.1016/S0165-1765(02)00221-5

20. Cingano, F. 2014. *"Trends in Income Inequality and its Impact on Economic Growth"*. OECD Social, Employment and Migration Working Papers, December 2014. OECD Publishing. doi: 10.1787/1815199X

21. Coibion O., Gorodnichenko Y., and Weber M. 2019. *"Monetary Policy Communications and their Effects on Household Inflation Expectations"*. University of Chicago: Becker Friedman Institute for Economics. doi: 10.2139/ssrn.3315749

22. Dahan, M., and Tsiddon, D. 1998. "Demographic Transition, Income Distribution, and Economic Growth." *Journal of Economic Growth* 3(1): 29-52. doi: 10.1023/A:1009769930916

23. Darvas, Z. 2019. "Why is it so hard to reach the EU's poverty target?" *Social Indicators Research* 141 (3): 1081-1105. doi: 10.1007/s11205-018-1872-9

24. Dávila-Fernández, M. J., and Punzo, L. F. 2021. "The Kuznets Curve of the Rich." *Economic Systems* 45 (4) 100910. doi: 10.1016/j.ecosys.2021.100910

25. De Dominicis, L. 2014. "Inequality and growth in European regions: Towards a place-based approach". *Spatial Economic Analysis*, 9(2):120-141. doi: 10.1080/17421772.2014.891157

26. Edward, P., and Sumner, A. 2018. "Global poverty and inequality: are the revised estimates open to an alternative interpretation?." *Third World Quarterly* 39 (3): 487-509. doi: 10.1080/01436597.2017.1401461

27. Engle, R., and Granger, C. 1987. "Co-integration and Error Correction: Representation, Estimation and Testing." *Econometrica* 55 (2): 251-276. doi: 10.2307/1913236

28. Fedorov, L. 2002. "Regional Inequality and Regional Polarization in Russia, 1990-99". *World Development* 30(3):43-56. doi: 10.1016/S0305-750X(01)00124-3

29. Forbes, K. J. 2000. ”A reassessment of the relationship between inequality and growth”. *American Economic Review* 90(4):869-887. doi: 10.1257/aer.90.4.869

30. Galor, O., and Zeira, J. 1993. ”Income distribution and macroeconomics.” *Review of Economic Studies* 60 (1): 35-52. doi: 10.2307/2297811

31. Galor, O., and Moav, O. 2004. ”From physical to human capital accumulation: inequality and the process of development.” *Review of Economic Studies* 71 (4): 1001-1026. doi: /10.1111/0034-6527.00312

32. Granger, C. W. J. 1988. ”Causality, cointegration, and control.” *Journal of Economic Dynamics and Control 12* (2–3): 551-559. doi: 10.1016/0165-1889(88)90055-3

33. Grundler, K., and Scheuermeyer, P. 2018. ”Growth effects of inequality and redistribution: what are the transmission channels?”. *Journal of Macroeconomics* 55(C):293-313. doi: 10.1016/j.jmacro.2017.12.001

34. Halter, D., Oechslin, M., and Zweimüller, J. 2014. ”Inequality and growth: the neglected time dimension”. *Journal of Economic Growth* 19(1):81-1044. doi: 10.1007/s10887-013-9099-8

35. Josifidis, K., Supic, N. and Glavaski, O. 2018. ”Institutional Changes and Income Inequality: Some Aspects of Economic Change and Evolution of Values in CEE Countries.” *Eastern European Economics* 56 (6): 522-540. doi: 10.1080/00128775.2018.1487265

36. Kuznets, S. 1955. ”Economic growth and income inequality.” *American Economic Review* 45(1):1-28. Accessed 17 July 2021. https://www.jstor.org/stable/1811581

37. Lazăr, D., and Litan, C. M. 2024. ”Inequality, growth, and structural transformation: new evidence from a post-communist economy”. *Comparative Economic Studies* 66(2): 236-260. doi: 10.1057/s41294-023-00214-w

38. Michálek A., and Výbošt'ok, J. 2019. "Economic Growth, Inequality and Poverty in the EU". *Social Indicators Research* 141:611-630. doi: 10.1007/s11205-018-1858-7

39. Neef, T., and Sodano, A. 2022. *"2022 DINA Regional Update for Europe".* World Inequality Lab Technical Note No. 2/2022. World Inequality Database. Accessed 12 May 2023. https://wid.world/document/2022-dina-regional-update-for-europe-world-inequality-lab-technical-note-2022-02/

40. Perotti, R. 1996. "Growth, income distribution and democracy: what the data say." *Journal of Economic Growth* 1 (2): 149-187. doi: 10.1007/BF00138861

41. Persson, T., and Tabellini, G. 1994. "Is Inequality Harmful for Growth?." *American Economic Review* 84 (3): 600-621. Accessed 10 March 2021. https://www.jstor.org/stable/2118070

42. Pesaran, M.H., Shin, Y. and Smith, R. P. 1999. "Pooled Mean Group Estimation of Dynamic Heterogeneous Panels." *Journal of the American Statistical Association* 94(446):621-634. doi: 10.2307/2670182

43. Pesaran, M.H., Shin, Y., and Smith, R.P. 2001. "Bounds testing approaches to the analysis of level relationships". *Journal of Applied Econometrics* 16(3): 289-326. doi: 10.1080/01621459.1999.10474156

44. Pesaran, M.H. 2004. *''General Diagnostic Tests for Cross Section Dependence in Panels".* Cambridge Working Papers in Economics no. 0435, UK: University of Cambridge. doi: 10.17863/CAM.5113

45. Ravallion, M. 2001. "Growth, inequality and poverty: looking beyond averages." *World Development* 29 (11): 1803-1815. doi: 10.1016/S0305-750X(01)00072-9

46. Solow, R. M. 1956. "A Contribution to the Theory of Economic Growth". *The Quarterly Journal of Economics* 70(1):65-94. Accessed 12 October 2024. https://www.jstor.org/stable/1884513

47. Stiglitz, J. E. 2013. *"The Price of Inequality: How Today's Divided Society Endangers Our Future"*. New York: W. W. Norton Publishing

48. Svirydzenka, K., 2016. *"Introducing a New Broad-based Index of Financial Development"*. IMF Publishing. Accessed 18 August 2023. https://www.imf.org/en/Publications/WP/Issues/2016/12/31/Introducing-a-New-Broad-based-Index-of-Financial-Development-43621

49. Todaro, M., and Smith, S. 2015. *Economic Development*. 12th ed. UK: Pearson. Accessed 25 March 2021. https://www.pearson.com/en-us/subject-catalog/p/economic-develo pment/P200000006431/9780137614813

50. Westerlund, J. 2007. "Testing for Error Correction in Panel Data." *Oxford Bulletin of Economics and Statistics* 69 (6): 709-748. doi: 10.1111/j.1468-0084.2007.00477.x