Revisiting 'Income inequality and economic growth: a panel VAR approach'

Johannes Coetsee - 19491050[a]

[a]*Stellenbosch University*

Abstract

This paper attempts to replicate and critique Atems & Jones (2015), in which the authors attempt to model the contemporaneous effects of income inequality and economic growth of the United States at the state level, using a Panel Vector Autoregression (PVAR) approach.

Keywords: Panel vector autoregression, Income Inequality, Economic Growth

1. Introduction

This paper attempts to replicate the paper by Atems & Jones (2015). It will specifically emphasise the methodological approach used by these authors in an attempt to uncover whether their PVAR approach holds against checks for robustness.

The paper will be structured in the following manner: for completeness, a overview of the primary differences between the PVAR and VAR approaches will be given, after which the contribution of Atems & Jones (2015) will be discussed. Section 2.2 looks at their methodological approach through a critical lens, thereby also informing which robustness checks are considered the important to include in the current analysis.

2. Section 2

2.1. Panel Vector Autoregression

Panel Vector Autoregressions are, as the name indicates, a variation of the standard VAR approach applied to panel datasets. Whereas VAR's treat all variables in a given system as endogenous, the PVAR approach also allows for unobserved individual heterogeneity. As panel data is comprised out of

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various cross-sectional units of observation - in our case, states - a VAR approach to model interactions between endogenous variables need to account for the fact that the underlying structure might differ across these units. A PVAR approach therefore imposes an additional restriction, namely, that the underlying structure is the same for all of the units of analysis. However, Love & Zicchino (2006) notes that this restriction is highly likely to be violated in practice. In order to overcome this additional restriction on the parameter, Love & Zicchino (2006) suggest the introduction of fixed effects, thereby allowing for individual heterogeneity in the levels of the variables. Crucially, these fixed effects are correlated with the regressors because of the necessary inclusion of dependent variable lags in the model (the 'autoregressive' aspect of VARs), meaning that mean-differencing - the standard method used to eliminate fixed effects - will bias the regression coefficients. To solve this problem, Arellano & Bover (1995) advocate for the usage of the 'Helmert procedure', where the means of only the future observations for each unit is removed. This procedure therefore transforms the variables in a way that preserves the orthogonality between the variables and the lagged regressors, which, in turn, allows for the usage of the lagged regressors as instruments whereby the coefficients of the systems can be estimated. Moreover, these orthogonal relationships provide the necessary moment conditions that allow for VAR estimation using Generalized Method of Moments (GMM).

2.2. Inequality and Economic Growth (Atems & Jones, 2015)

a new comprehensive panel of annual U.S. state-level income inequality data from 1930 to 2005 constructed by Frank (2009b), this study reconsiders the relationship between inequality and per capita income using a panel VAR approach. A panel VAR allows not only for the examination of the correlation between income inequality and per capita income, but also the dynamic responses of these variables to income and inequality shocks, as well.

Methodology

Data

There are three datasets used by Atems & Jones (2015) that are relevant for our discussion. The first, data on state-level economic growth, is measured by the annual change in per capita real income for the 48 contiguous US states (listed in the Appendix) for the period 1930-2005.

Atems & Jones (2015) uses a panel of state-level income inequality data (sourced by Frank (2009)), for the period 1930-2005 for the United States. Their measure of inequality, the Gini coefficient, is constructed using tax filing data. The usage of tax data is often considered problematic in that it excludes low-income earners, thereby introducing possibly misleading results.

overview of the data as a prelude to the estimation of the structural VAR. Our dataset consists of

annual data on the percentage change in per capita real income and various income inequality measures for the 48

Results

3. Section 3

4. Conclusion

References

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Appendix

- Table of 48 states and the state sample splits