

**Referee Report of the paper with the title: “The nexus between unemployment rate and shadow economy: A comparative analysis of developed and developing countries using a simultaneous-equation model”**

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The authors’ paper studies the effects and causal links between the shadow economy and the unemployment rate using a dynamic simultaneous-equation panel data model for 38 developing and 40 developed countries over the 2000-2015 period. Their analysis suggests that there is a unidirectional and negative causality running from the unemployment rate to the shadow economy in the developing countries. However, in the developed countries, there is a bidirectional and negative causal relationship between the shadow economy and unemployment rate. The sensitivity of the results makes us realize that institutional quality interacts strongly with the relationship between the shadow economy and the unemployment rate. In countries with a good institutional quality, the unemployment rate is associated with a weak informal economy, whereas in countries with low institutional quality, it strongly drives the informal economy.

This is an interesting, purely empirically written paper. However as it stands now, I can NOT recommend it for publication; it has to undergo a major revision and then it might become a publishable piece.

I have the following 3 critical points:

**(1) What is really new?**

Reading carefully 1.) introduction and 2.) the literature review it is not clear for me, what is really new in this paper, or what do I read and/or learn for the first time!

(i) Is it the simultaneous estimation of unemployment (ue) and the shadow economy (se)? If so, what is new then?

(ii) Is it the influence of political and economic institutions on both ue and se and then the interaction between ue and se? If so, the authors should show this, especially what they found out for the first time.

(iii) Is it the difference in the results between developing and highly developed countries?

The authors should clearly tell the reader what is new.

A reader should really know what is new; especially they provided a quite careful and well done literature review.

## **(2) Missing theoretical considerations and core hypotheses**

What is amazing that the authors start in chapter 3 at once with the empirical testing. They should include a small chapter "theoretical considerations", where they summarize in a very condensed way the theoretical findings and end with 2-3 core hypotheses. Here it does NOT matter whether they can derive the expected signs on  $ue$  and or on  $se$  in clear cut way. If they can theoretically justify it they can leave the sign open or undecided; but they have to do this!

## **(3) Ad chapters 3, 4, and 5.**

In general the empirical investigation is well done. I have the following critical points:

5.1.) In table 4 the regression results for all countries are missing; and on page 17, table 2 should be table 5 and again the regression results for all countries are missing.

5.2) What is a more severe problem, that in tables 4 and 5 partly the same independent variables are used as independent variables (e.g. tax burden, openness,) in the SE equation. However these variables already have been used to construct the  $se$  variable which it is not directly observable but a using the MIMIC-procedure a calculated one. I suggest the authors use here the data set by C. Elgin and O.Oztunali " Shadow economies around the world: model based estimates", Bogazici University, Department of Economics, Working paper No.:[2012/15](#). Applying this data set of the  $se$  they can use all independent variables, they use in their regression in tables 4 and 5. With the current data set they should provide a regression NOT using the independent variables: Size of government, Tax burden, Government effectiveness.

5.3.) The SIZE GOV and TAX BURDEN both measure the "same thing", I suggest, to use only one of them.

5.4) The  $se$  variable is NOT statistically significant in UNEMP regression for the developing countries (in both tables 4 and 5!). Can the authors at least try to give an explanation?

## **(4) Overall evaluation**

This paper is interesting and brings out some interesting results. However, it needs a major revision.

If the authors carefully tackle all my three critical points, I can recommend it for publication.