Chapter 16
An Endogenous Switching Model to Poverty Dynamic Assessment in Tunisia:
A New Proposal

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ABSTRACT

This paper focus on the determinants of poverty dynamics in Tunisia by performing a two-stage endogenous model using a Bayesian algorithm to avoid missing data. Based on this approach author show that panel data analysis can be performed through potential variables such presented by the work of Donald B. Rubin. This contribution is rather empirical; researcher propose a method based on the concept of causal inference that enable to execute a panel data model using independent surveys. As the author assert the dependence between poverty status over time, they choose to use an endogenous switching model take into consideration the form of endogeneity caused by initial condition.

1. INTRODUCTION

Reducing poverty is a serious challenge for all countries. Over the last decade, the dynamics of poverty has been the subject of many empirical researches (Bane and Ellwood, 1986).

Generally, those who are experienced poverty cannot escape from his trap. Many economists have tried to find the origin of persistent poverty (Azariadis, 1996; Barrett & Swallow, 2006; Cappellari & Jenkins 2004), and wondered if we are poor because we are born poor or we are become poor over time. The literature present several explanations. Mainly, the failure of the economic systems, the weakness of the education programs, that may limit the opportunities to have a decent job and causes a higher unemployment rates, and exogenous shocks (Aliber, 2003). In the development countries, the weakness of infrastructure such as roads and communication, may limit poor people to have access to information or to the labor markets.

In particular, in Tunisia, government has implemented public policies to improve economic growth and to fight against poverty. As a consequence, the real consumption per capita has increased to hit 3.31 percent at 2005 and 2.5 at 2010 (2005 as base). The INS[1] report argue that poverty has increased face to a stable Gini index (36%) but considered very higher relative to other emerging countries. Despite this progress, poverty and inequalities between regions is one among the causes of the Tunisian revolution. A better identification of poverty leads to a better policies of fighting against poverty. Unfortunately, in Tunisia like the most developing countries, the knowledge of the group that belong to the poor class in developing countries is not entirely clear task. Lack of survey data necessary to analyze the patterns of income in the long term is a key reason to adopt a new methodology. For these reasons, studies on poverty dynamics in Tunisia are scarce. Among the few searches on Tunisia, we cite the work of Ben Rejeb (2008) who used pseudo-panel approach to estimate the permanent expenditures. In addition, Jmaii and Belhadj (2016) used fuzzy approach to run a dynamic analysis based on the Jalan-Ravallion framework.

In this paper, author propose a new approach based on multiple imputation and causal inference (Rubin, 2004). The methodology enable to compute a poverty rates that can reflect the real situation of poverty in Tunisia. Following the work of Rubin (2004) and based on Bayesian statistics, each variable was imputed from the observed data, taking into account the uncertainty associated with each step in the imputation process. Each complete base, thus generated, provides an estimate of the parameter of interest, and then a single estimator is obtained by calculating the mean of these estimates. Concretely, this paper study the determinants of poverty dynamics by individual socio-demographic characteristics considered stable over time.

The rest of the paper is structured as follows. Section 2 exposes methodology of the proposed approach. Section 3 presents the chosen model. In section 4, we detailed the data and the variables. Results are presented in the fifth section. Finally, section 6 concludes.

2. METHODOLOGY OF THE PROPOSED APPROACH

2.1. Potential Variable With Missing Data

Missing data is an unavoidable problem in the practice of statistics. Donald Rubin has formalized a causal model that allows to identify the assumptions that are necessary to support an observational study is similar to an experimental study (Rubin, 1987; Imbens & Rubin, 2009).

Rubin counterfactual model is based on two basic concepts: the causal statements and potential responses. Causal statements are also called treatment in the tradition of the counterfactual causal analysis. Each unit of analysis of a study should potentially be found in any of the examined causative states. In practice, this approach is close to the matching method in which researchers apply a treatment to a group in order to compare it with another group that did not receive the treatment. In fact, random assignment of an experiment ensures that each unit of analysis will be potentially found in a causal statement (Little and Rubin, 2014). Conceptually, fifty percent of the information are not observable to be able to estimate the causal effect. This is a missing data problem. This inability to observe two causal statements, simultaneously, for the same unit of analysis was named the fundamental problem of causal inference (Holland, 1986). According to this approach, and in the context of our analysis, panel data can be treated as a causal inference problem and a particularly case of missing data problem.

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