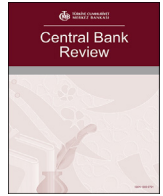


Contents lists available at [ScienceDirect](#)

Central Bank Review

journal homepage: <http://www.journals.elsevier.com/central-bank-review/>

Informality and structural transformation

Orhan Erem Atesagaoglu^a, Deniz Bayram^b, Ceyhun Elgin^{c,*}^a Istanbul Bilgi University, Turkey^b Denizbank, Turkey^c Bogazici University, Turkey

ARTICLE INFO

Article history:

Received 27 October 2017

Received in revised form

15 November 2017

Accepted 15 November 2017

Available online xxx

Keywords:

Informality

Structural transformation

DGE models

Panel data

ABSTRACT

In this paper, we investigate the evolution of the informal sector through structural transformation. We develop both a three-sector and a five-sector dynamic general equilibrium (DGE) model, which can simultaneously account for structural transformation between agriculture, industry and services, and between the informal and formal sectors. First, we incorporate the informal sector into an otherwise two-sector (agriculture and non agriculture) DGE model. Then, we augment this model and build a five-sector DGE model extending the non-agricultural sector into industry and services, to separately account for the evolution of informality in these two sectors. The calibrated model performs remarkably well in accounting for the evolution of the sectoral employment shares and the size of the informal sector. Finally, we use panel data econometric tools to investigate the empirical relationship between structural transformation and the informal sector and find a strong negative relationship between the size of non-agricultural sector and informality.

© 2017 Central Bank of The Republic of Turkey. Production and hosting by Elsevier B.V. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

1. Introduction

Economic growth is usually accompanied by substantial changes in the composition of production and employment. These changes generally manifest themselves as a shift of resources from the traditional to modern sectors. Over the past decades, the analysis of how structural transformation occurs and its impacts has been an important focus of research. Different papers have tried to explain the source of reallocation of resources among sectors using multi-sectoral models. However, most papers have focused on sectorizing the economy in terms of agriculture, industry, and services; ignoring a specific issue, informality, which affects the use of resources both among and within sectors. Informality poses serious economic challenges across the world, also affecting allocation of inputs across sectors (See [Schneider and Enste \(2000\)](#) as well as [Elgin and Oztunali \(2012\)](#)).

There is a well-known literature that studies structural transformation in the context of home production (see, for example, [Gollin et al. \(2004\)](#), [Ngai and Pissarides \(2008\)](#) and [Rogerson \(2008\)](#)). These papers develop models of time allocation across

sectors, accounting for both market and home production. Although home production is sometimes interpreted to be a part of the informal sector, home production and informal sector are not equivalent. The informal sector is defined by [Buehn and Schneider \(2012\)](#) as market-based production activities that are deliberately concealed from state authority to avoid taxation and regulation. Our framework differs from the home production literature in this regard, as we investigate the evolution of the market-based but hidden sector through structural transformation.

The main contribution of this paper is to build up a framework which can simultaneously account for structural transformation between agriculture, industry and services, and between the informal and formal sectors. In this paper, we first incorporate the informal sector to an otherwise two sector structural transformation model. We show that the size of the informal sector decreases through the transformation of the economy from the agricultural to non-agricultural sector. Then, we build a five-sector model extending the non-agricultural sector into industry and services, in order to account for informality in these two sectors separately. We show that informality declines in both sectors while it remains higher in services. Finally, we use panel data analysis to investigate the effect of structural change on informality. Our findings show that a higher non-agricultural sector size is associated with lower levels of informality.

The multi-sector models trying to the explain sources of

* Corresponding author.

E-mail address: ceyhun.elgin@boun.edu.tr (C. Elgin).

Peer review under responsibility of the Central Bank of the Republic of Turkey.

<https://doi.org/10.1016/j.cbrev.2017.11.002>1303-0701/© 2017 Central Bank of The Republic of Turkey. Production and hosting by Elsevier B.V. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

reallocation across sectors rely mainly on two types of approaches. The first-type of models view structural transformation as a supply side phenomenon. In these types of models, changes in the structure of production and employment are driven by sectoral differences in productivity growth rates or capital intensities. The pioneering work emphasizing the importance of differential rates of productivity growth on structural transformation was done by Baumol (1967) and Baumol et al. (1985). Ngai and Pissarides (2007) provide a modern version of Baumol's hypothesis using exogenous differential rates of productivity growth to explain allocation of capital and labor across sectors. Acemoglu and Guerrieri (2008) provide a framework which shows that different capital intensities and capital deepening can together generate structural transformation. Caselli and Coleman (2002) shows that the productivity of skilled and unskilled labor changes over the course of structural transformation.

The second-type of models, which view structural transformation as a demand side phenomenon, are based on Engel's law. These types of models make use of sectoral differences in income elasticities of demand by utilizing non-homothetic preferences. One of the first papers in this vein is Gollin et al. (2002) which explains industrialization by using the relationship between the dynamics of sectoral employment shares and consumer demand. Another paper which makes a strong case for the impact of Engel's law on structural transformation is Kongsamut et al. (2001). In this paper, they build a three-sector model where consumers have Stone-Geary preferences over agricultural good, manufactured good and services. The other papers combine two different approaches to build a hybrid model (see, for example, Duarte and Restuccia (2010) and Rogerson (2008)). Our framework is also based on a hybrid model, in which structural transformation is driven by both non-homothetic preferences and differential rates of productivity growth.

The informal sector is considered to be an important characteristic of both less-developed and advanced economies, and one which has serious economic and social consequences. Schneider and Williams (2013) provides a comprehensive overview of the shadow economy from a global perspective and Buehn and Schneider (2016) focuses on the definition and causal factors of the informal economy, providing a comparison of the size of shadow economies using different estimation methods. Schramm (2014) estimates the equilibrium effects of taxation on sectoral choice and informal sector. Elgin and Uras (2013) investigates the relationship between financial development and the size of the informal economy. Many studies so far have utilized theoretical models to illuminate the determinants and complexities of informality. For example Fortin et al. (1997), in order to study the effects of taxation and wage controls on the extent of informal economy, builds a model with firm heterogeneity, where a formal and an informal sector endogenously emerge in some productive branches of the economy. Ihrig and Moe (2004) use a two sector dynamic general equilibrium model to investigate the effects of tax rates and enforcement policies on the size of the informal sector. Antunes and Cavalcanti (2007) construct a model with credit constrained heterogenous agents, financial frictions and occupational choices over formal and informal businesses. In this paper we build upon the framework of Ihrig and Moe (2004) to model the interaction between the formal and informal sectors. Moreover, the modelling of informality is also similar to the one in Elgin (2015). However, the current paper significantly differs from these papers by modelling informality in a multi-sector environment and investigating the relationship between informality and structural transformation of an economy that manifest itself as a shift through different sectors.

The paper is organized as follows. Section 2 summarizes the theoretical framework. Section 3 and Section 4 includes detailed descriptions of the three-sector and five-sector versions of the model. Section 5 presents the quantitative implications of the model. Next, Section 6 conducts an empirical analysis in line with the model's predictions. Finally, Section 7 provides some concluding remarks and a discussion.

2. Theoretical framework

This section includes three - and five - sector models of structural transformation. In the three sector model, we lay out a framework which accounts for the transition from the agricultural to non-agricultural sector. The structure of the agricultural sector is built on the work of Gollin et al. (2002), where a one-sector neoclassical growth model is extended to include a explicit agricultural sector. In our model, the non-agricultural sector involves both the formal and informal sectors. To account for resource allocation between the formal and informal sectors, we use the framework of Ihrig and Moe (2004).

Then, we extend our framework to a five-sector model, in order to also investigate resource allocation between industry (manufacturing henceforth, to avoid confusion) and services. Here, informality is incorporated into both of the non-agricultural sectors. Allocation of resources between these two sectors is driven by differential rates of productivity growth as emphasized by Ngai and Pissarides (2007). Therefore, structural transformation in the economy is explained by both the non-homothetic preferences and sectoral differences in productivity growth (for a similar environment, see also Bah (2009)).

3. The three-sector model

3.1. Environment

There is a representative household, which has K_0 units of initial endowment, owns the total land for the economy and has a time endowment $T > 0$. It allocates its time endowment across three sectors every period inelastically and consumes two types of goods: agricultural and non-agricultural. The lifetime utility of the household is given by a Stone-Geary variety:

$$\sum_{t=0}^T \beta^t [\log(C_{M_t}) + V(C_{A_t})] \quad (1)$$

where C_{A_t} and C_{M_t} stands for consumption of agricultural good and non-agricultural good, respectively. Utility from agricultural consumption $V(C_{A_t})$ takes the form

$$V(C_{A_t}) = \begin{cases} -\infty & \text{if } C_{A_t} < \bar{C}_A \\ \min(C_{A_t}, \bar{C}_A) & \text{if } C_{A_t} \geq \bar{C}_A \end{cases}$$

which implies that the household has to consume at least \bar{C}_A units of agricultural good. After reaching agricultural consumption level \bar{C}_A , it will only desire non-agricultural good. Introducing this non-homotheticity will allow labor to flow out of the agricultural sector after reaching the subsistence level agricultural good, regardless of the state of non-agricultural sector (Gollin et al. (2002)).

The economy consists of three sectors: agriculture, formal non-agriculture and informal non-agriculture. Agricultural production has a Cobb-Douglas form of technology which employs land (L_t)

Download English Version:

<https://daneshyari.com/en/article/7396089>

Download Persian Version:

<https://daneshyari.com/article/7396089>

[Daneshyari.com](https://daneshyari.com)