



Services reform and downstream economy-wide performance: The case of Bulgaria



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HIGHLIGHTS

- Services reform including competition in services markets in Bulgaria is measured.
- These reforms in services have an effect on downstream firm performance.
- Firm performance is measured in terms of Total Factor Productivity (TFP).
- Both downstream goods and firms are taken into account when computing TFP.

ARTICLE INFO

Article history:

Received 16 June 2016

Received in revised form

24 August 2016

Accepted 25 September 2016

Available online 11 October 2016

JEL classification:

F14

F63

D24

Keywords:

Services reform

TFP

Firm-level data

ABSTRACT

This paper provides new evidence on the impact of services sector reforms on domestic firm productivity. It extends the previous literature on this topic by using firm-level data from Bulgaria, by developing an up-to-date TFP measure, and by taking stock of the downstream performance of the entire economy, covering goods as well as services firms. The results show that indeed services reform are an important driver for the wider downstream economy, particularly reforms in electricity, insurance and telecom. More importantly, a novel issue is that the results also show that sheer competition in services markets also forms a significant determinant for downstream firm TFP.

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1. Introduction

This paper provides an empirical assessment using firm-level data of how services reform affect downstream firm performance in both goods and services in Bulgaria.

Services reform has been on the agenda of many countries around the world in an attempt to reap higher welfare gains. Yet relatively little is known about the real drivers. In particular, two previous studies have shown the link between domestic services reform and TFP for the case of Czech Republic (Arnold et al., 2011) and India (Arnold et al., 2010). Services reform comes in many ways, such as opening up markets for foreign direct investment

(FD), abolishing services monopolies or state-owned enterprises, or creating market entry for both domestic and foreign services suppliers by abolishing market access barriers, amongst others.

This paper contributes to the existing empirical literature in the following ways. One, it develops an up-to-date TFP measure that uses physical productivity rather than revenue productivity. This productivity measure assumes a demand structure without using observed value added. Second, services reform should affect all firms in the domestic economy, including those active in services. Services firms themselves are big users of services inputs.¹ Moreover, services output account for a substantial part

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<http://dx.doi.org/10.1016/j.econlet.2016.09.027>

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¹ Typically, in Bulgaria around 50% of the total input consumption of manufacturing sectors is on average comprised of services. This figure increases to an average of almost 80% for services sectors. These numbers exclude personal services such as health, household services or education.

of Bulgaria's GDP, namely 66%. We therefore take account of all downstream firms in our data set. Third, we cover both types of direct and indirect outcome indicators of services reform that previous studies have developed separately.

2. TFP and services reform

2.1. Downstream TFP performance

Our TFP measure is based on Hsieh and Klenow (2009, 2014) which follows a so-called structural demand approach at the firm-level from data. The TFP measures is computed with firm-level data which is provided by Bulgaria's National Statistical Institute (NSI).² This strategy of TFP calculation consists of specifying a production technology for firms, imposing a preference structure, and using empirical counterparts for value added, capital and labour to back-up TFP.

In essence, it means that in the production function we indirectly compute physical output of the firm to compute TFP. In addition, we use factor shares that are common across firms at the sector-level. As such we are not calculating a TFP measure that works with value added by means of absence of firm-level prices usually in the data. Instead, we compute the physical productivity of the firm. This type of TFP is appropriate since it carves out distortions in the economy that will lead to deviations in the firm's choices of capital and labour, which in particular is likely to be present in a developing country such as Bulgaria, and which is also likely to be taken up when using a productivity terms based on revenue, i.e. value added.

Hence, using a specific CES demand structure allows us to circumvent this problem to map value added indirectly into output. When applying this methodology to data it means that we compute parameter values for the factor shares for each sector and take them from another European economy that is presumably less affected from distortions, in our case Germany. It also means that we need to have an estimate for the elasticity of substitution in the utility function which we adopt from the various estimates in the previous literature.

2.2. Services reform

To quantify the impact of services reform on firm-level TFP we need to come up with variables that measure services liberalization or de-regulation in one way or another. These measures need to be sector-specific, non-binary and time-varying. Two sets of variables are therefore developed. One is through an index approach which includes services sector reform indicators taken from the European Bank of Reconstruction and Development (EBRD). They are called the "Structural Change Indicators". Sectors include banking, non-bank financial institutions (insurance), electricity, land transport (road and rail), telecom and water. These indices measure the extent to which transition economies have undertaken reforms in privatization and competition against the standards of industrialized market economies.

The second set of variables are so-called outcome variables from the Bulgaria firm-level data at hand. This means that these measures encompass implementation as well as policies. The advantage of using these variables is that they offer additional inside into the relative importance of various aspects of services reform. This is because with the data we are able to set out (a) the extent to which foreign investors have entered the Bulgarian

economy in services sectors, (b) the level of competition in services sectors in Bulgaria.

The degree to which there is a presence of foreign investors in Bulgaria is measured by the share of foreign-owned firms in sectoral sales. This information is given in the data and varies from a low 2.3% to a full foreign ownership of 100%.³ To calculate the fraction of foreign owned firms in sectoral sales the foreign ownership share is multiplied with the firm's output / sales, which is the net sales revenue of each firm. This share of foreign output is calculated at the 2-digit level as provided in the original data for all services sectors covered.

The level of competition in each services sector is calculated through two indices of concentration, namely the Herfindahl index which is the sum of the squared market shares of all services firms in a particular sector, in addition to the market share of the four largest services providers. Besides, a last indicator is also included that measures the extent to which services providers are also exporters or not. The recent trade literature points out that exporters are generally more productive than non-exporters. If services providers also have larger export shares as part of their total revenue supply services to domestic downstream industries, this effect should be visible in our downstream productivity data. Since the Bulgarian data set comprises information on the share of export revenue in total revenue we are able to verify whether productivity effects are truly passed on to the rest of the Bulgarian economy.⁴

3. Empirical strategy and results

3.1. Empirical strategy

As in Arnold et al. (2010, 2011) the identification strategy used in this empirical exercise relies on the assumption that industries and sectors which are more dependent on services inputs will feel the services sectors reforms to a greater extent than industries that are less reliant on services as part of their inputs use. To take stock of this inter-sectoral effects, each of the reform proxies is interacted with the input-dependence of each downstream industry (and sector) on services. The national input–output table of Bulgaria provides information on the reliance of each industry and sector on services. For our analysis we take the earliest year possible, which is 2008.⁵ Hence, the independent variables measuring services linkages using the services reform indicators can be written as follows:

$$\text{services linkage}_{jt} = \sum_k a_{jk} * \text{reform index}_{kt}$$

where a_{jk} is the amount of inputs sourced by any industry or sector j from services sector k , computed as a share of the overall input use. The second term on the right-hand side of this equation represents one of the reform measures in services sector k over time t as explained above, namely the EBRD indices, foreign and export share of firm sales, plus the competition indicators. Together this multiplication of sectoral services reform indices and

³ Only 6.4% of all observations (i.e. firms) record a foreign share that is higher than zero. When including all non-foreign-owned firms (i.e. firms with zero foreign ownership) the average foreign ownership is 6.3% in 2005 which decreased to 5.2% in 2010.

⁴ Some firms with a foreign-owned share also show exports. The share of firms with a foreign-owned share which also report positive export share is 35%.

⁵ This year lies in the middle of our small panel data. However, Arnold et al. (2010) also use input–output matrix of a year which lies in the middle of their panel survey. Moreover, as the authors note, using input–output tables rather than firm-level data on the services input reliance has the advantage of avoiding firm-level correlation with productivity performance of each firm in the data set.

² The firm-level data are the non-financial enterprise data from the NSI where Mining and Energy firms are not representative since a significant share of firms in these two sectors were excluded due to confidentiality reasons.

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