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The effects of externalities on productivity growth in Spanish industry

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Abstract

The paper discusses the role of externalities in promoting industrial growth in Spanish regions. We try to identify whether the so-called dynamic externalities (technological spillovers) come from outside the industry (Jacobs type externalities) or whether they are generated between firms inside the industry (Marshall–Arrow–Romer or MAR type externalities). Moreover, this study attempts to test the effects of competition on innovation and growth (Porter type external effects). Related to earlier work by the authors on static and dynamic externalities analysis, this paper restricts the analysis to dynamic externalities using productivity, instead of labor. The empirical analysis is based on data from the Spanish Industry Survey from 1978 to 1992 for 26 manufacturing branches. We find evidence of dynamic effects due to specialization (MAR) that depend on the level of this variable. While specialization seems to affect productivity growth negatively, once it reaches a certain level, its effect on growth becomes positive due to knowledge sharing. However, we do not find clear evidence on the presence of diversity (Jacobs) and competition (Porter) externalities.

Keywords: Externalities; Knowledge spillovers; Productivity growth

JEL classification: R11; O30; O41

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1. Introduction

This paper applies to Spanish manufacturing data the kind of analysis carried out in Glaeser et al. (1992) and Henderson et al. (1995) to find evidence about the role of dynamic externalities[1] influencing the growth of economic activities in the territory. However, we have overcome various limitations of these papers: firstly we have used productivity instead of labor to measure industrial growth; secondly we have endogenously derived the indexes that measure external effects. Also, we included capital in the production function based model we use and, finally, we do not focus on a few specific industries but on a full range of industries and regions. The empirical analysis is carried out using up to 26 large industrial branches for the 50 Spanish provinces between 1978 and 1992.

In this paper we find mixed evidence on the role of specialization externalities (Marshal–Arrow–Romer or MAR type externalities). If specialization is sufficiently high, it seems to be positive for growth as Henderson (1994) argues. On the other hand, if specialization is low, we find a negative effect on growth, a result that coincides with Glaeser et al. (1992). We do not find clear evidence on the presence of diversity (Jacobs type) and competition (Porter type) externalities.

The rest of the paper is organized as follows. In Section 2.1, we elaborate on the notion of externality as it is not obvious what the appropriate definition is. We propose a simple typology that guides the rest of the paper. Section 2.2 derives the indexes used to identify externalities and presents the model from which estimation equations are obtained. Section 3.1 contains a brief description of the data and a discussion of the province–industry trends that emerge after the first exploitation of this data. In Section 3.2 we discuss the specifications used in our empirical search for externalities. The main results are offered in Section 3.3. Finally, Section 4 provides some concluding comments.

2. Externalities

2.1. Definitions

Although the analysis of innovation has usually been confined to the interior of the firm, the idea that external sources of knowledge are important has gradually

[1] In the rest of the paper we will refer to externalities or to dynamic externalities indifferently. Dynamic externalities influence the development of activity along time while static externalities produce contemporaneous once-and-for-all effects on activity. See Glaeser et al. (1992) for a tentative exploration of the presence of static externalities. We used and extended their approach to test for static externalities in de Lucio et al. (1996). There we find evidence of static urbanization economies, we also find evidence of crowding-in between the biggest industries in each territory and the rest of the industries but we fail to find any static localization economies. By localization economies we mean advantages due to the presence of specialized inputs markets while urbanization economies refer to large output markets characterizing urban environments.