ABSTRACT. This paper investigates dynamic interrelationshps between the births and deaths of firms at the level of the 88 Finnish subregions during 1989–1993. The births-deaths nexus of firms is analysed using vector autoregressions (VAR) and an instrumental variable estimator. The main findings are: first, that the firm births equation has a two-year lag structure, which means that firm deaths cause firm births, and firm births cause subsequent births following two-year lags; and second, that according to the firm deaths equation, which has a one-year lag structure, firm births do not cause firm deaths, but firm deaths cause subsequent deaths. A further finding is that the use of the ordinary least-squares estimator produces inconsistent, and clearly different results from those produced by the instrumental variable estimator.

1. Introduction

In recent years the births and deaths of firms have been widely studied in a spatial context (see e.g. Reynolds, Storey and Westhead, 1994a; and Spilling, 1996). In particular, regional determinants of firm births, such as unemployment and output, as well as other factors on the supply and demand side, have received much research attention (Audretch and Fritsch, 1994). A general finding is that a growth in local demand and the dominance of the small-firm sector are the primary conditions associated with firm formation at regional levels (Kangasharju, 1997). Most studies have been conducted in a static environment, applying the OLS method (see e.g. Reynolds, Storey and Westhead, 1994b). There are also studies that have analysed the regional determinants of firm deaths (see Moyes and Westhead, 1990; Keeble and Walker, 1994; and Westhead and Birley, 1994); or the joint emergence of births and deaths, i.e. studies of business turbulence such as that by Tervo and Niittykangas (1994).

Attention is now turning to the interdependencies of births and deaths; and in some cases, investigations have been carried out even in dynamic settings (see e.g. Rosenbaum and Lamort, 1992 and Love, 1993). For example, Carree and Thurik (1993) used a one-period lag structure when investigating the determinants of births and deaths. Johnson and Parker (1994) allowed for the existence of a longer lag structure, and found that firm births would have a lag structure of as many as six years, and deaths a lag structure of two years. Johnson and Parker (1996) reported that when they included variables proxying regional characteristics in the analysis, they ended up with a two-period lag structure. They concluded (1994 and 1996) that births cause deaths and deaths cause births at a regional level, although their 1994 study concluded that the latter connection was not demonstrated to any conventional level of significance. They investigated the interdependencies using OLS estimator.

The present paper continues this line of enquiry, and begins by investigating the interdependence between the births and deaths of firms in a dynamic context using the method pioneered by Holtz-Eakin, Newey and Rosen (1988) where vector autoregressions (VAR) are estimated with panel data. This method includes an instrumental variable estimator, the use of which avoids the problem caused by the correlation between the lagged dependent variable and the lagged error term. The analysis is carried out across the 88 Finnish subregions, which reflect real trading and commuting areas, and covers the years 1989–1993. The results obtained in the present paper are quite the opposite of those found by Johnson and Parker. Unlike them, we find that
deaths (Granger) cause births, whereas births do not cause deaths. Further, obtained lag lengths and the signs of the parameters differ between the studies.

Second, in an attempt to elucidate the probable reasons for the different results, our paper briefly describes the differences of detail between the method used by Johnson and Parker (1994 and 1996) and that used in our study and shows that, the different estimators produce clearly different results, and thus, are the probable reasons for the conflicting results between the studies.

This paper is organised as follows. Section 2 provides a concise treatment of the theoretical framework, and section 3 discusses the relevant econometrics. Section 4 describes the data, and section 5 presents the results. Section 6 shows the effects of the OLS estimator on the results, and section 7 concludes the paper.

2. Theoretical framework

A dynamic interrelationship between the entries and exits of firms implies the existence of two opposing forces, termed the “multiplier” and the “competition” effects (Johnson and Parker, 1994). The multiplier effect occurs when births give rise to yet more births, and slow down the incidence of deaths; or when deaths give rise to further deaths and slow down the rate of new births. The competition effect occurs when births give rise to deaths and decrease the rate of births; or when deaths increase the rate of new births and slow down the rate at which deaths occur.

The multiplier effect may be generated, for example, by a new firm which stimulates output in a region through forward and backward linkages. A new firm may need to subcontract from, or it may produce suitable intermediates for, other firms. On the other hand, the bankruptcy of a crucial firm may cause the deaths of firms that had forward or backward connection with the closed-down firm. Furthermore, a new firm may serve as a demonstration of a good business idea for other potential founders of firms. This demonstration effect may be particularly applicable to the small business context. This effect is also empirically supported by the finding that the presence of small firms is one of the regional characteristics, which most clearly encourages firm formation (Kangasharju, 1997). Finally, the multiplier effect may work through changes in the income level of a region. A new firm may increase the income level of employees in a region, which leads to further foundations of firms through increased consumption. Similarly, the closing down of a firm may decrease incomes and thus cause the future deaths of firms.

The well-known concept of Schumpeterian creative destruction is an example of the competition effect. According to this model, new, more innovative and efficient new firms take over the market from older and less efficient ones, and thus firm births cause subsequent deaths. The well documented “push effect” of a recession serves as an example of deaths increasing the subsequent rate of firm births. A firm’s death may cause new firm foundation, if a former employee of a closed-down firm decides to start a business of his or her own. Similarly, in the oligopolistic sense a rise in business deaths may increase the subsequent rate of births, if the closing-down of firms has the effect of lowering entry barriers in the market. A firm’s death may also decrease the incidence of deaths, if it decreases competition in the market.

According to Johnson and Parker (1994), a third effect, the “Marshall effect”, must also occur because the birth of a firm must necessarily be followed at some stage by its own death. There is clear evidence that most new firms do not last more than a few years (see e.g. Storey, 1988; Bennet, 1989; and Littunen, Storhammar and Nenonen, 1997). Many studies talk about the “death valley” of the first few years, which many new firms do not survive (see e.g. Gibb, 1990). In other words, the Marshall effect can be expected to occur particularly during the early years.

Table I summarises the three effects, demonstrating their expected signs assuming a one-year lag. In reality, effects may also manifest themselves over longer and varying time periods. For example, firm foundation takes time, and hence the effects leading to it may take a longer period to work through. Similarly, an incumbent does not usually close a firm down immediately difficulties begin, but instead will often struggle for a long time. Below, we follow Johnson and Parker (1996) and assume that the multiplier, competition and Marshall effects mainly occur following two-year