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Ownership of intellectual property and corporate taxation

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ABSTRACT

Intellectual property accounts for a growing share of firms' assets. It is more mobile than other forms of capital, and could be used by firms to shift income offshore and to reduce their corporate income tax liability. We consider how influential corporate income taxes are in determining where firms choose to legally own intellectual property. We estimate a mixed (or random coefficients) logit model that incorporates important observed and unobserved heterogeneity in firms' location choices. We obtain estimates of the full set of location specific tax elasticities and conduct ex ante analysis of how the location of ownership of intellectual property will respond to changes in tax policy. We find that recent reforms that give preferential tax treatment to income arising from patents are likely to have significant effects on the location of ownership of new intellectual property, and could lead to substantial reductions in tax revenue.

1. Introduction

The growing importance of intellectual property as a factor in production,[1] and concern that it is easier for firms to shift income from this source than it is from others, presents challenges for tax design. Firms can and do position their intellectual property with a view to reducing tax liabilities. However, despite these concerns, firms do not by and large locate the legal ownership of intellectual property in the lowest tax countries, and corporate income taxes still raise considerable amounts of revenue in most developed countries. In this paper we address the question of how influential corporate income taxes are in determining where firms choose to legally register ownership of an important form of intangible assets, patents.

Our contribution is to extend the empirical literature on public policy and firm location choice by introducing new methods to this area of public economics. We estimate a mixed (or random coefficients) logit model that incorporates both observed and unobserved heterogeneity in firms' location choices (see inter alia, Berry et al. (1995, 2004), Nevo (2001) and Train (2003)). A key strength of this approach is that it allows us to compute own and cross tax elasticities across locations that reflect patterns of correlation in observed choices in the data, and therefore to capture more realistic substitution patterns than standard logit models. Our estimates allow us to conduct ex ante analysis of how the location of ownership of intellectual property will respond to changes in policy. We use our estimates to simulate responses to recent policy reforms that provide preferential tax treatment to income arising from patents. We find that these reforms are likely to have significant effects on the location of ownership of new intellectual property, and could lead to substantial reductions in tax revenue. Our estimates could be used to simulate a wide range of other counterfactual situations.

We use comprehensive panel data on all patent applications made to the European Patent Office (EPO) by a large number of innovative European firms over 1985–2005. A patent is a legal document that grants a firm the exclusive rights to use or licence a novel technology for a specified period of time. A firm can register legal ownership of a patent in a subsidiary that is located in a country different to the firm's headquarters, different to the location where the underlying technology was created and different to the location where the intellectual property will be applied. Lipsey (2010) notes that, in multinational firms, intangible assets "*have no clear geographical location, but only a nominal location determined by the parent company's tax or legal strategies*." For example,

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[1] OECD (2006, p34) describes the growing significance of intellectual property and its simultaneous use by many different parts of a firm as "one of the most important commercial developments in recent decades". NESTA (2009) estimates that in the UK knowledge investment overtook fixed capital investment in the mid-1990s and is now about 50% higher.

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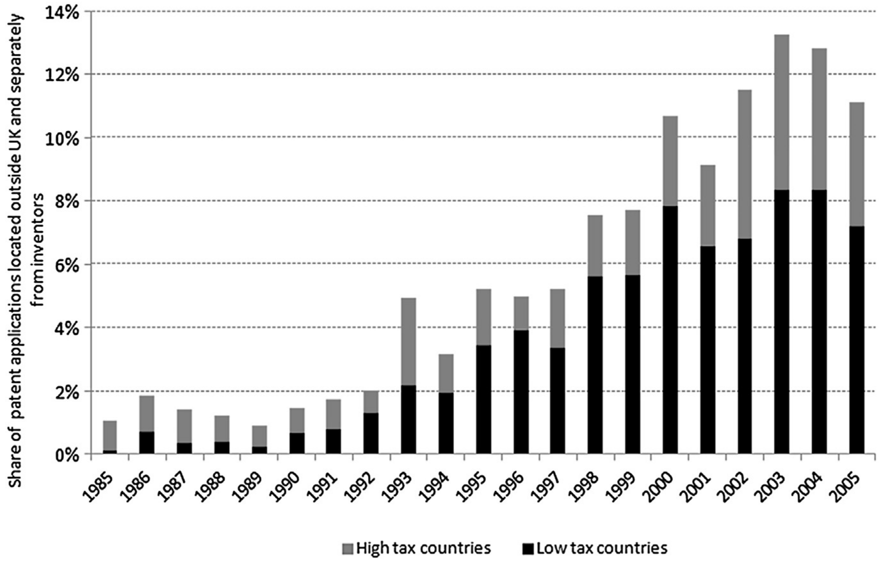

Fig. 1. Share of patent applications made by subsidiaries of UK parent firms that are located offshore and separately from innovative activity. Notes: The bars show the share of total patent applications made by subsidiaries of UK parent firms where the subsidiary is located outside of the UK, and is not in a country where associated innovative activity was carried out. Low (high) tax countries are defined as those locations that have a statutory tax rate less (greater) than the UK.

Fig. 1 shows the share of patent applications made by UK parent firms where the legal ownership is registered outside of the UK and in a separate place to where the underlying innovative activity occurred. This share has increased six-fold over the past two decades. The largest proportion has gone to countries that have a lower tax rate than the UK, but the amount going to countries with a higher tax rate has also increased.

We model the impact of tax on where firms choose to locate the legal ownership of patents. Tax could influence this decision because the legal ownership of the patent will be one of the determinants of where the income derived from the patent is taxed. The profits earned from the exploitation of intellectual property will be the result of a number of activities, including the research and development (R&D) investment undertaken to create the new idea, the financing of this investment and the subsequent commercialisation. When these activities take place in multiple countries, as is often the case for multinational firms, the returns must be allocated to individual jurisdictions for tax purposes.

Firms have an incentive to arrange their activities in such a way that, all else equal, profits accrue in the country in which they would pay the lowest tax. There are a number of strategies that can be used to achieve this. Such strategies commonly require that the income earned from exploiting intellectual property accrues outside of the country in which the underlying R&D took place. One way to achieve this is through contract R&D. For example, a subsidiary in a relatively low tax country may finance (and bear the risk for) R&D activities that are contracted to a related subsidiary in a higher tax country (possibly with the benefit of R&D tax incentives and access to high skills levels). The contract will specify the payment to be made for the R&D activities (commonly equal to the costs incurred plus an arm's length mark-up). Returns above this payment, either from using the technology directly or from licensing it, will accrue to the subsidiary that bore the financial risk. There is a tax advantage to this strategy if the true value of the R&D activities is less than the price paid for the contract R&D. A similar result may be achieved through the use of a cost sharing agreement that specifies how subsidiaries will share the costs, risks and returns associated with an R&D project. Such agreements may be designed such that the right to exploit and capture the returns from a technology accrues to a subsidiary in a low tax country. The strategies available to a firm depend on how the firm is organised and on the precise tax rules they are subject to (Finnerty et al. (2007)).

Tax rules limit a firm's ability to manipulate where income arises for tax purposes. Shifting income typically requires that payments made to compensate the company that conducts the R&D, or royalties made for the use of a technology, are at preferential prices. There are transfer pricing rules that aim to enforce the principle that the prices of intra-firm transactions are set as if they had occurred between unrelated parties — this is the arm's length principle. However, these transactions often do not have market counterparts, which means that firms may have opportunities to set the prices of related transactions in such a way as to reduce tax liability.[2] Tax rules, including those that dictate how a firm can allocate the returns to innovative activities, differ across European countries and are different to those faced by US multinationals. For example, countries differ on the acceptable methods used to calculate payments for contracted R&D services, and where there are cost sharing agreements, countries differ in the requirements over whether all subsidiaries involved in the agreement need be engaged in R&D (in contrast to the US, not all European countries allow holding companies in low tax locations to be part of cost sharing agreements).

The corporate tax rate is likely to be an important determinant of the location in which a firm chooses to hold legal ownership of intellectual property. However, it is unlikely to be the only factor; we would not expect all intellectual property to be legally registered in the lowest tax countries. Indeed, legal ownership of patents is rarely in the set of small countries that are often considered to be tax havens. The patents that are legally owned in such countries accounted for fewer than 0.5% of all patent applications made to the European Patent Office over the period 2001–2005, and many of those are unrelated to European firms.[3] This could be due, at least in part, to the operation of Controlled Foreign Company (CFC) regimes, which effectively seeks to tax income at the higher home country tax rate if it is deemed to be located in a low tax country for tax purposes. More generally, there may be characteristics of a location over and above its corporate tax rate that firms value. For example, the strength of intellectual property rights protection and market size might play a role, and, all else equal, firms may

[2] When determining the correct transfer price there are both conceptual difficulties — it can be hard to separately determine the value that arises from integrated activities that take place across countries, and practical difficulties — firms have more information than tax authorities and an incentive to minimise their tax liability.

[3] Figure based on patent applications made by applicants located in Bahamas, Barbados, Bermuda, Cayman Islands, Gibraltar, Hong Kong, Liechtenstein, Malta, Monaco, Netherlands Antilles, Panama or Singapore.