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Globalisation, corporate taxes and the taxation of intellectual property

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Public Economics Lectures, 2010

Some (probably) familiar trends

- Globalisation – goods, services, people, firms, income etc now move more easily across national borders
  - Falls in transport and communication costs

- Large multinationals locate different parts of their business operations in different countries
  - A large proportion of **goods** are produced offshore - e.g. china as the world's factory;
  - Increasing attention to **innovation** offshore - e.g. firms choosing Shanghi as well as silicon valley;
  - Firms holding **income** offshore - e.g. tax havens from Bermuda to the Isle of Man to Liechtenstein

- Intellectual property (and the associated innovations) plays an increasingly important role in growth

Challenges for corporate tax

- How do governments treat the income which firms earn or hold offshore?
  - Should this income be taxed?
  - How can this be achieved?
- How to tax mobile income?
  - That is, income which firms can easily move offshore
- How should governments respond to corporate tax policy in other countries?
  - policies which act to encourage firms to shift income to low tax countries
  - In recent years a number of EU governments have introduced favourable tax treatments for the income derived from intellectual property
  - Should the UK government engage in tax competition in order to be seen as an attractive location for this kind of income?

Lecture plan

- Corporate taxes & offshore profits
  - How do corporate taxes work in relation to income earned offshore?
  - How do firms shift income to low-tax countries and how do governments set out to prevent this?

- Favourable tax treatment for intellectual property (IP) and international tax competition
  - Consider a current piece of research
  - How does the location of intellectual property respond to corporate taxes?
  - What is the affect of Patent Boxes – policies which sharply reduce the rate of corporation tax for the income from patents?

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How does corporation tax work?

- Tax on firms' profits (=income from sale of goods and services – business costs) with allowances for capital depreciation
  - Other elements: R&D tax credits, investment allowances
- A few things to note:
  - Current statutory corporate tax rate is 28% (21% for small companies)
  - Relation to personal income tax: net profits are distributed to shareholders (and then taxed as personal income)
  - Corporations don't bear taxes - incidence on people
    - Owners, workers or consumers
  - Why have a corporation tax?
    - Use govt. provided services; payment for limited liability status & state insurance; withholding tax (from individuals)
- What income should govt. seek to tax and does this include offshore income? Consider the following example…

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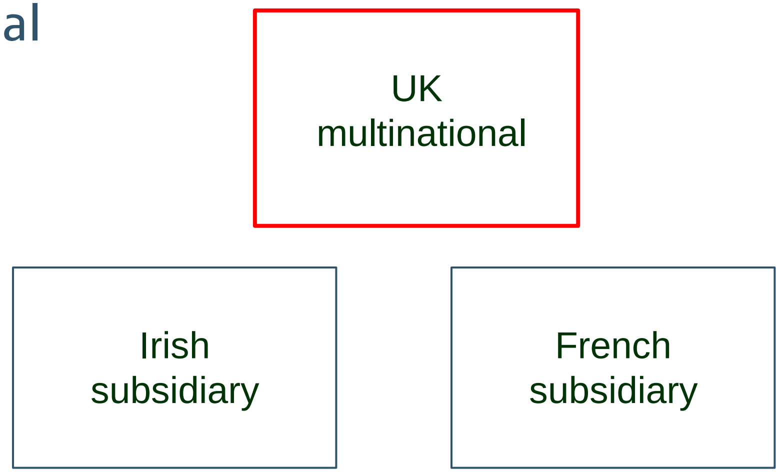
Taxing offshore income; example

- A UK multinational has two subsidiaries, one in Ireland and the other in France, and earns income in each of the three locations
- UK levies corporation tax on the income earned in the UK by the UK multinational



Taxing offshore income; example

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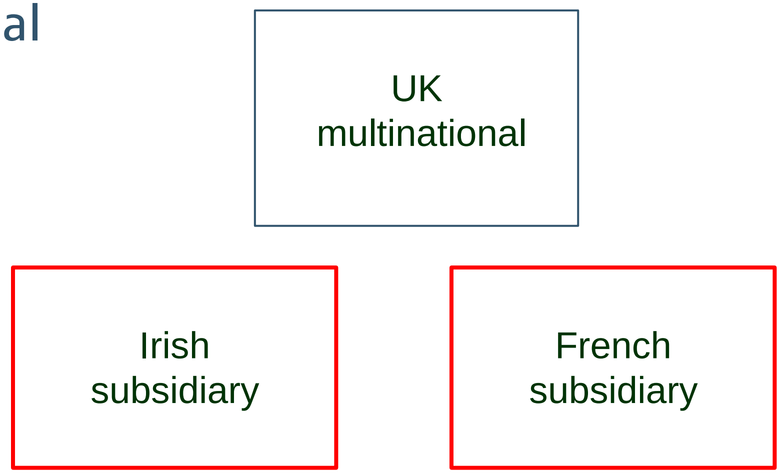

- What about the income earned in France and Ireland?
  - This income will be taxed in France (34%) and Ireland (12.5%)
  - Does/should the UK levy additional tax on ‘foreign source income’?
  - What about if the income is remitted back into the UK?

Taxing offshore income; Credit Vs Exemption

- Countries operate different systems with respect to ‘foreign source income’

1. Credit system

- when profits are brought back into the UK, UK corporation tax applies with a credit given for any tax already paid in the other country

2. Exemption system

- no additional tax when income repatriated

Taxing offshore income; Credit Vs Exemption

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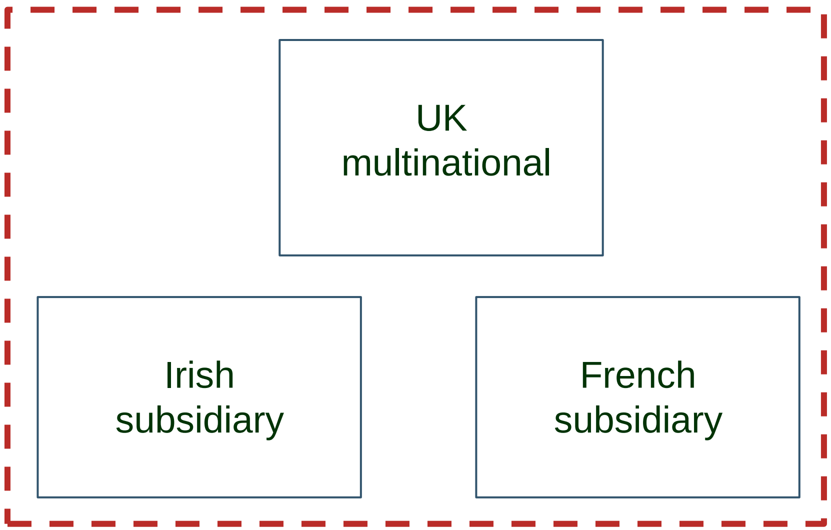
Taxing offshore income; Credit Vs Exemption

1. Credit system: tax foreign source income in the UK with a credit

- In principle, UK corporate tax rate applies to worldwide income of a firm (---)



- Principles
  - Neutrality: aim not to distort decisions, inc how much invest & who carries out investment
  - Credit system: Capital Export Neutrality – offshore investments are treated the same for tax purposes
    - Desirable but not complete in practice
- UK operated this kind of system until 2009

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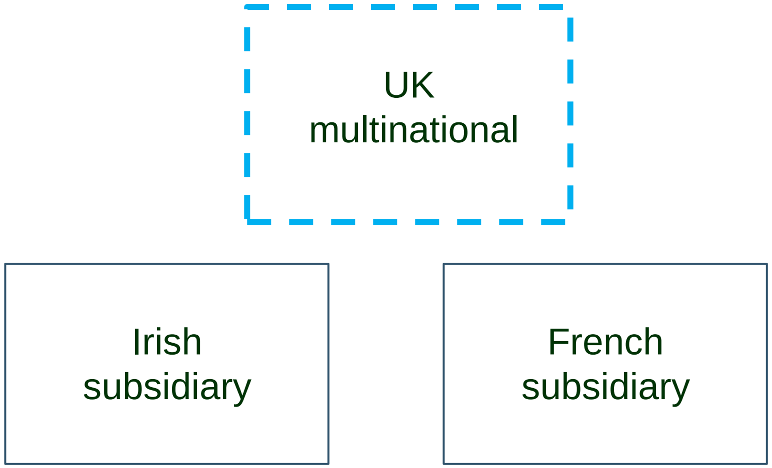
Taxing offshore income; Credit Vs Exemption

2. Exemption system: no additional tax when income repatriated

- apply UK corporate tax only to income earned in the UK (---)



- Principles
  - Capital Ownership Neutrality – investments treated the same, regardless of ownership
    - would need all countries to operate an exemption system
  - UK now operates this exemption system

Taxing offshore income; Anti-avoidance

- Within both systems there is scope for the avoidance of UK corporate tax
- The UK government (and others) therefore operates anti-avoidance rules
  - Protect what the government deems to be its tax base
  - Basic principle: **'Controlled Foreign Companies'** regime defines (i) the offshore subsidiaries and (ii) the income, deemed taxable in the UK
- Credit system: *Keep income offshore (tax levied when remitted)*
  - Don't target income in all offshore subsidiaries of UK HQ firms: focus on those in 'low-tax' countries (and avoid 'active' subsidiaries)
- Exemption system: *Move income offshore and then remit to the UK tax free*

How to shift income to a low-tax country?

- Imagine you're a firm, headquarted in a country operating an exemption system. How do you shift income to reduce the tax bill?

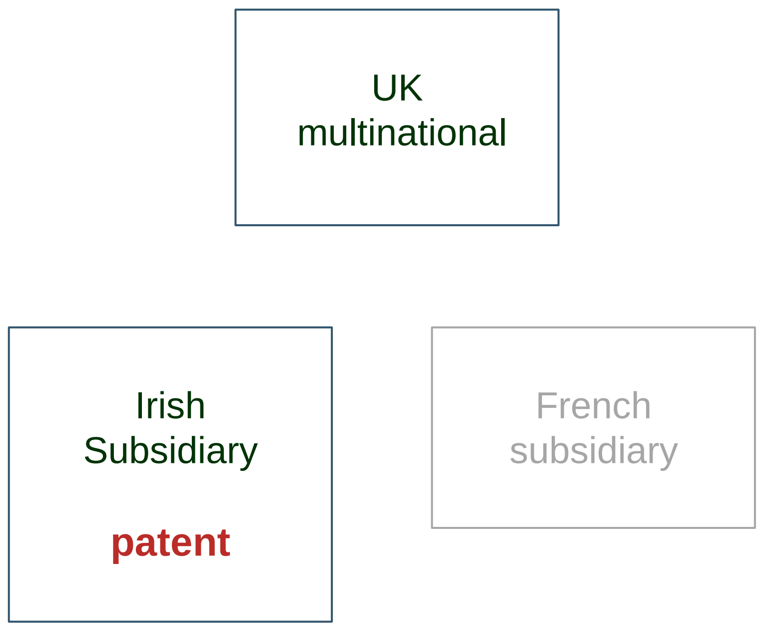
- Might already have offshore sub. producing goods
  - Profits not taxable in the UK
  - Choice of location affected by tax **and** other factors (eg workforce)

- Let's say, you open a subsidiary in a low tax country. What next?
  - loads of ways to pay lower taxes - I'll describe one here
  - (also, move financial asset offshore and repatriate returns as tax free dividends; allocate shared expenses to high tax country; shift income using debt)

- Relocate mobile income (income which firms find it easy to move); e.g. income from intellectual property. Take the example of a patent…
  - A patent is a legal document that grants an individual, institution or firm the exclusive rights to use (or license) a novel technology for a specified period of time (usually 20 years)

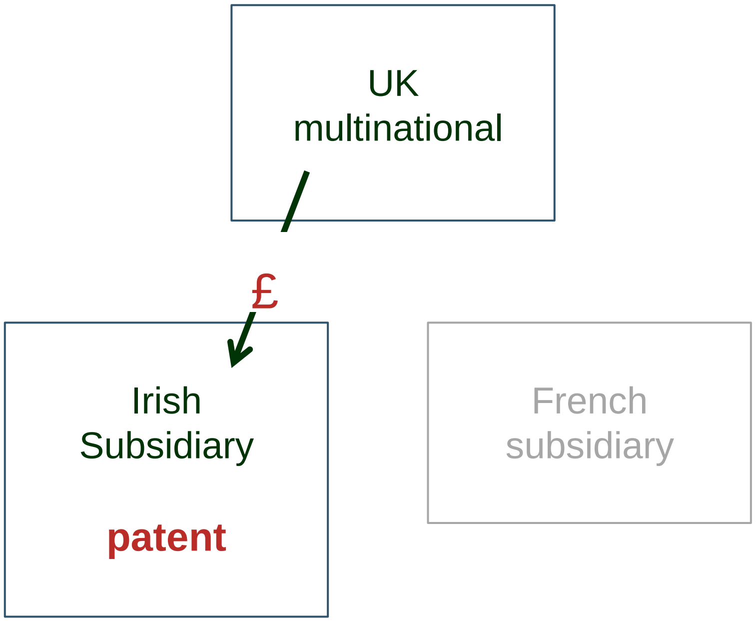
How to shift income to a low-tax country?

- UK multinational holds a patent in the Irish subsidiary



How to shift income to a low-tax country?

- UK multinational holds a patent in the Irish subsidiary
- Uses the technology underlying the patent (for example in the production of goods) and makes a payment to the Irish sub.
  - Income then taxed at lower Irish rate,12.5% (not at UK rate, 28%)
  - Reduction in worldwide tax bill



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How much income to shift?

- Income is a payment for use of technology (think of as a licence fee). How to price that technology?
- Not observed by the government (there's no market which sets prices)
- **Transfer pricing** – arm's length principle
  - the price should be set as if the transaction were taking place between two unrelated companies
  - Sets a bound on how much income can be shifted
- Governments aim to prevent tax motivated income shifting
  - How to do this is currently under consultation by the UK govt.
    - Similar CFC regime to identify mobile income in low tax countries
  - Considerations to prevent taxing IP that is 'actively managed' offshore

Summary: corporate taxes & offshore income

- Levying corporation tax involves consideration of the globalised nature of firms and their ability to hold profits offshore
- Corporate tax systems treat foreign source income differently
  - Credit (tax worldwide income)
  - Exemption (no tax for foreign source income)
    - there has been a move towards operating exemption systems
- Systems include anti-avoidance rules, aim to prevent firms
  - retaining income in low tax countries (credit)
  - Shifting income to low tax countries (exemption)
- In particular, the UK currently faces questions of how to ensure that firms don't hold intellectual property offshore in a low tax country and remit the profits tax free

Intellectual property

- Intellectual property (IP) – property rights which grant ownership of ideas; includes copyrights; trademarks; patents
- Ensure that the creators of an idea can appropriate the returns - with this there would be a vastly reduced incentive to invest in new ideas
- Knowledge represents an increasingly important part of economic growth
- Income from IP is highly mobile – presents a challenge for govt in deciding how to tax such income

Intellectual property

- Relevant to two recent policy areas:

1. How to treat intellectual property in anti-avoidance rules now that we've moved to an exemption system

2. Should the UK introduce a Patent Box – a reduced rate of corporation tax for the income derived from patents?
   - Patent Boxes have recently been introduced in Belgium, the Netherlands, Luxembourg and Spain
   - Makes these countries more attractive locations for holding the income derived from patents
   - In 2009 UK announced plans to introduce a Patent Box in 2013 – currently under consultation

- Focus on patents in the rest of lecture

Patents and Patent Boxes

- Patent Box: a reduced rate of corporation tax for the income derived from patents
- Patents are an important form of intellectual property
- Patent Boxes in the Benelux countries
  - Belgium - 6.8% (full rate, 34%)
  - Netherlands - 10% (full rate, 25%)
  - Luxembourg - 5.9% (full rate, 39%)
- UK proposal for 10%. Current statutory rate, 28%
  - Falling to 27% next year and by an additional percentage point each year becoming 24% in 2014

Intellectual property; Questions

- How does corporate tax affect where firms choose to locate patents?
- What are the likely effects of recent policies to make tax systems more favourable for the income derived from patents?
- Are we starting to see a process of tax competition between European countries?
- (If time… What kind of activity is a Patent Box likely to attract and would this policy benefit the UK)

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The location of patent holdings

- What does this mean?
  - firms can and do locate different aspects of their activity separately.

- Number of decisions associated with a patent:
  - where to conduct research? (before you get a patent you need to have a novel idea)
  - where to protect that idea?
  - which subsidiary will legally hold the intellectual property
    - Earn the income and be liable for the associated tax
    - might not be a choice for small domestic firms but is definitely a choice for large firms

Patent example:

(54) Title: USE OF AN ANGIOTENSIN II TYPE 1 RECEPTOR ANTAGONIST IN THE MANUFACTURE OF A MEDICAMENT FOR THE TREATMENT OF CARDIOVASCULAR COMPLICATIONS

(51) International Patent Classification[7]: **A61K 31/41**, A61P 9/10

(21) International Application Number: PCT/SE00/01444

(22) International Filing Date: 5 July 2000 (05.07.2000)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
9902597-5 6 July 1999 (06.07.1999) SE

(71) Applicant *(for all designated States except US)*: **ASTRAZENECA AB** [SE/SE]; S-151 85 Södertälje (SE).

(72) Inventors; and
(75) Inventors/Applicants *(for US only)*: **BJERREGAARD-PEDERSEN, Erling** [DK/DK]; Department of Medicine, Holstebro Hospital, DK-7500 Holstebro (DK). **LUFT, Friedrich** [DE/DE]; Franz-Volhard-Klinik, Abteilung f. Nephrologie, Wiltbergstrasse 50, D-13125 Berlin (DE). **SVENSSON, Anders** [SE/SE]; AstraZeneca R & D Mölndal, S-431 83 Mölndal (SE). **ZANNAD, Faiez** [FR/FR]; CIC-Inserm-CHU Nancy, Hopital Jeanne D'Arc, BP 303, F-54201 Toul (FR).

(74) Agent: ASTRAZENECA AB; Global Intellectual Property, Patents, S-151 85 Södertälje (SE).

(81) Designated States *(national)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

(84) Designated States *(regional)*: ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

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Patent example:

Invented by inventors in Denmark, Germany, Sweden and France

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Patent example:

The technology is due to be protected in a number of countries

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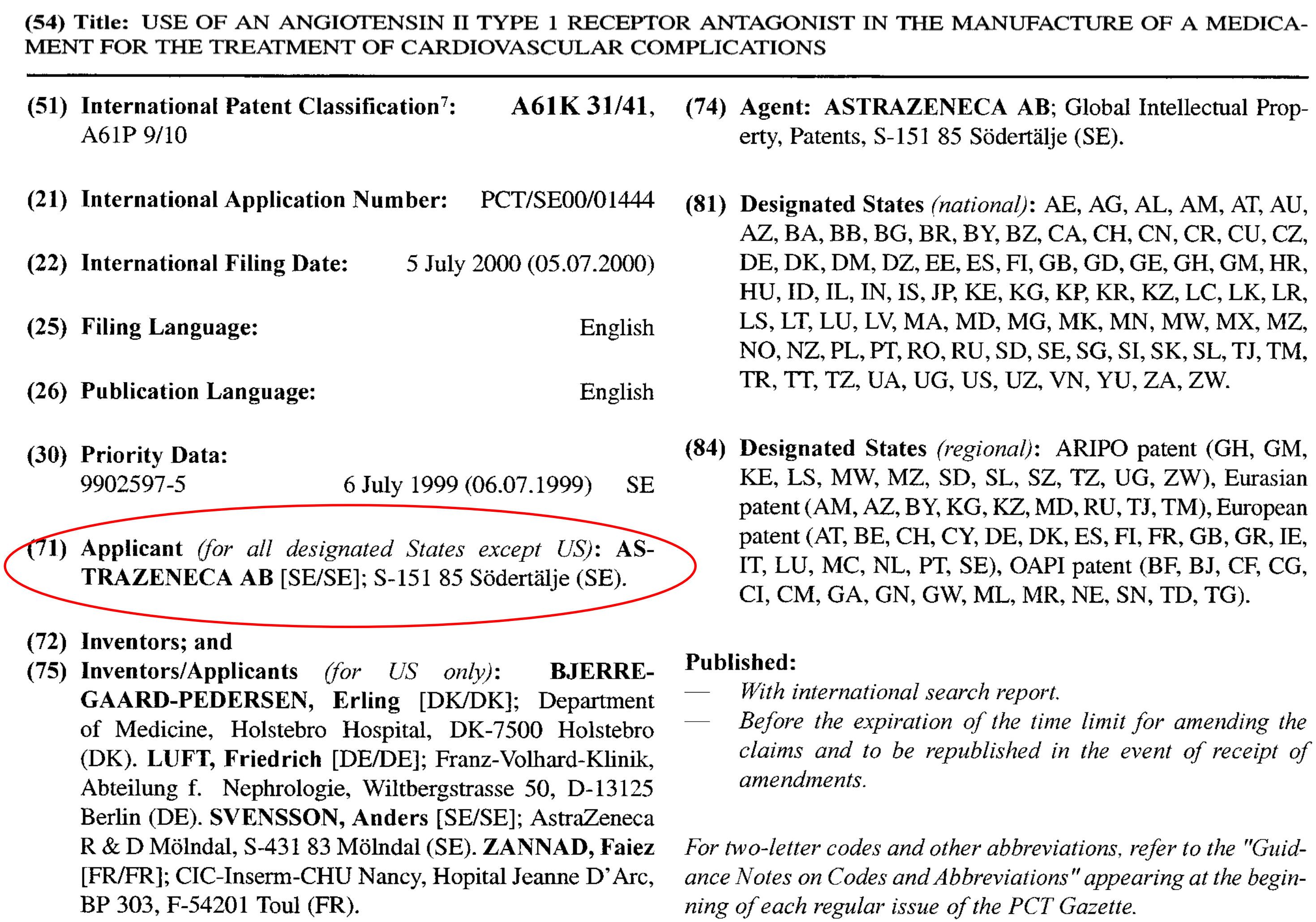
Patent example:

The Swedish company Astra Zeneca AB holds the application

This is a subsidiary of the UK multinational Astra Zeneca



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The location of patent holdings

- what does this mean? Answer:
  - Location of the subsidiary that holds the patent (and that will therefore receive any resulting income and be liable for the associated tax)
  - Note: this can be different from the location of the underlying research and where the technology will be used

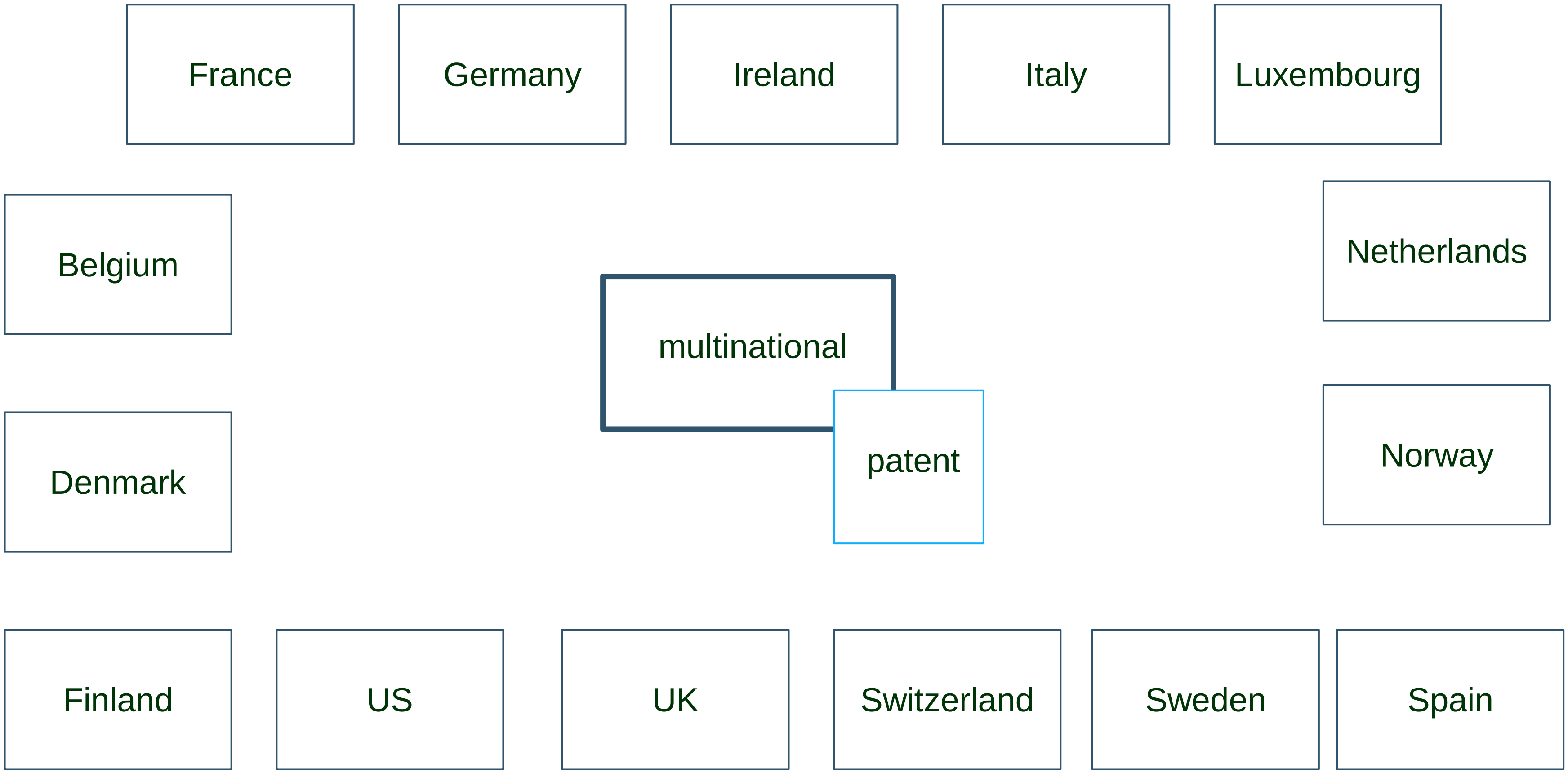
- **How does the location of firms' patent holdings respond to corporate taxes?**
  - current research looking at responsiveness of European multinationals

The location of patent holdings: *current research*

Data

- Patent applications filed to the European Patent Office by applicants in 15 European countries plus the US
- Match to firm-accounts data to identify parent firms
  - akin to attributing the Swedish Astra Zeneca AB to the UK multinational Astra Zeneca
- Get a mapping between European firms and the subsidiaries in which they hold patent applications
- Data on corporate taxes across 1985-2005
  - Statutory corporate rates
  - Controlled foreign company regimes
- Use data on 639 firms, 4,740 subsidiaries and 342,734 patent applications

Firms choosing where to hold patents



The location of patent holdings: *current research*

Method:

- Econometric analysis looking at the probability a firm chooses a location as a function of corporate taxes (and controlling for other confounding factors)

Findings:

- a reduction in the statutory rate of corporation tax increases the probability that a firm will hold a patent in a country
- How responsive are firms? Look at elasticities:
  - Own tax elasticity: how does the share of patents held in country A change when country A changes its tax rate?
  - Cross tax elasticity: how does the share of patents held in country A change when country B changes its tax rate?

The location of patent holdings: *current research*

How responsive are firms?

- We estimate that a ten percentage point fall in the tax rate would increase the share of patent holdings by between 7%-15%
  - Variation across countries. For UK, 11%
- Range of cross tax elasticities between pairs of countries
  - e.g. A 10% point increase in the Belgium tax rate leads to a 0.5% increase in the share of patents in the UK while the same increase in the French tax rate increase the UK share by 2.6% points.
  - Able to estimate how firms substitute between locations if different taxes change
- We find important heterogeneity: not all firms respond in the same way
  - There are difference according to firms size, industries and alongside unobservable dimensions

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The location of patent holdings

- **What is the likely affect of the Benelux Patent Boxes?**
  - i.e. How do we expect the location of patents to change when favourable tax regimes are introduced
- Don't observe firms actual behaviour – policies are too recent
- We use the model we've developed to simulate the effects:
  - firms hold more patents in Benelux countries
    - Proportional change in shares: Belgium & Luxembourg 160%; Netherlands 80%;
  - The UK experiences a reduction in the share of patents
    - Change from around 12% to 8.5%
  - (interactions with CFC regimes may mitigate effects – i.e. governments may write legislation to reduce the extent to which firms can freely move intellectual property to such countries)

The location of patent holdings

- Government revenues
  - non-Benelux countries, inc UK, experience a fall in revenue
  - Benelux revenue also reduced – the lower tax rate on each unit outweighs the positive increase in activity

- **What if the UK also introduced a Patent Box?**
- The UK gains share: 8.5% -> 17% (more patents are held in the UK than before any Patent Boxes)
- However, UK government revenue falls
  - govt own estimates suggest that the policy would lead to a loss in revenue

Tax competition

- what is it? Governments using tax burdens to compete to attract income (or foreign direct investment, capital, workers)
  - one government reduces its tax rate – gives others an incentive to do the same
- Evidence that such competition may be partly responsible for the falling corporate rates across Europe over the couple of decades
- Benelux countries have Patent Boxes; Spain also has a similar system and the UK has proposals on the table
  - maybe this is start of a corporate tax competition to attract mobile income?
- Consequences of tax competition?
  - In a similar vein to simulations above we calculate that countries would continue to lose both share and revenue if other countries, for example France, followed

Summary

- The income from intellectual property is highly mobile; firms can and do hold IP separately from other activities
- IP holdings respond to corporate taxes
- Benelux countries have introduce Patent Boxes which encourage firms to locate patent income offshore; the UK is considering plans to follow suite in 2013
  - Patent Boxes attract firms patent holdings but …
  - They lead to a reduction in government revenues and
  - are likely to be associated with ever falling gains in activity as other countries introduce there only favourable tax regimes
- potentially the start of a round of tax competition between European countries….

The UK Patent Box as an incentive to innovation

- Why would the UK introduce a Patent Box and is this a good idea?
- Govt. stated aim: *“strengthen the incentives to invest in innovative industries and ensure the UK remains an attractive location for innovation”*

However…

- We estimate that even if more firms chose to hold patents in the UK, government revenue seems likely to fall (& less attractive if tax comp starts)
- Become an attractive location for **income**, not necessarily **real activity**
  - firms can and do hold income separately from research activity
- Weak incentives to increase investment
- And poorly justified innovation policy
  - Not well targeted at externalities that justify govt. Intervention
- Also, administratively a Patent Box is very difficult to implement
- May be additional benefits, over and above tax revenue, which accompany patent income.
  - Would need to be sizable (of similar magnitude to tax revenue)
- Vary popular with some large patenting firms

References

Relevant chapters in recent Mirrless Review
(http://www.ifs.org.uk/mirrleesReview/dimensions)

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The Patent Box

- R. Griffith and H. Miller (2010), "Support for research and innovation", IFS Green Budget 2010 *(http://www.ifs.org.uk/publications/4732)*

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