UK Perspective On The Bayh-Dole Act

By Teri Willey and Richard Jennings*

Summary

The UK does not have legislation like the Bayh-Dole Act, but events in the mid-1980's leading to university invention ownership and responsibility, resulted in comparable impact. This was reinforced by significant financial support for technology transfer from the UK Government leading to many similarities between UK and U.S. technology transfer and some subtle but important differences.

Legislation and Policy

1978—The Patents Act and the Patent Co-operation Treaty. The 1977 Patents Act (which came into force in 1978) introduced the first major changes in patent law in the UK for decades and was enacted primarily to achieve harmonisation with the European Patent Convention. It made clear that inventions belonged to inventors unless made in the normal course of their duties to their employer, in which case inventions would belong to their employer.(1) Most UK universities chose to operate under the Act and developed policies of university ownership of inventions made by their employees. However, some, including Cambridge and Oxford, did not follow the Act, citing that their employees were hired to carry out scholarly activities and making inventions was not part of their remit as employees of the University.(2) A further development relevant to university technology transfer was the Patent Co-operation Treaty which also came into force in 1978. (3) Though the legislation was initially complex, it was later simplified (4) and use of PCT applications by universities has become the norm. The valuable ability to reserve a position in many countries while obtaining a preliminary review of the patent application facilitates the university licensing model.

1985—Universities gain the rights and responsibilities of invention exploitation. The National Research Development Corporation (NRDC) was set up in 1948 after WWII with the purpose of commercialising inventions made using public monies, whether in universities or public sector research laboratories. Important innovations such as penicillin, radar and the jet engine, although British in origin, had been developed successfully in the U.S. as part of the joint war effort. The NRDC was set up to protect and develop future inventions in the UK. The National Enterprise Board was set up in 1975 to help the privatisation of public sector industries and was merged with NRDC in 1981 to form the British Technology Group.(5)

The British Technology Group (BTG) essentially had a first right of refusal to university inventions made with public funds. It had some notable successes, including cephalosporin antibiotics, pyrethroid insecticides, cholesterol assays and magnetic resonance imaging. In 1983, however, in the wake of the failure to patent monoclonal antibodies, the Thatcher government announced that BTG's control over university patents was no longer acceptable, and BTG's right of first refusal on government-funded patents would end. This was followed by a further announcement in 1985 in the House of Commons that there were new plans on how to govern university-created patents and the granted right of first refusal to BTG, was officially rescinded in "recognition that creating incentives for knowledge transfer is beneficial both for the advancement of science and for the economy."(6) In the same year the Chairman of Science and Engineering Research Council, acting on behalf of all the UK Research Councils, wrote to UK universities offering them the opportunity to take on the rights and responsibilities of exploiting inventions arising from Research Councils funded research at their university and requesting information about the arrangements they had or proposed to make. The rights were provided, initially for a defined term (3 years in Cambridge) on the condition that adequate mechanisms were in place to facilitate commercialisation.

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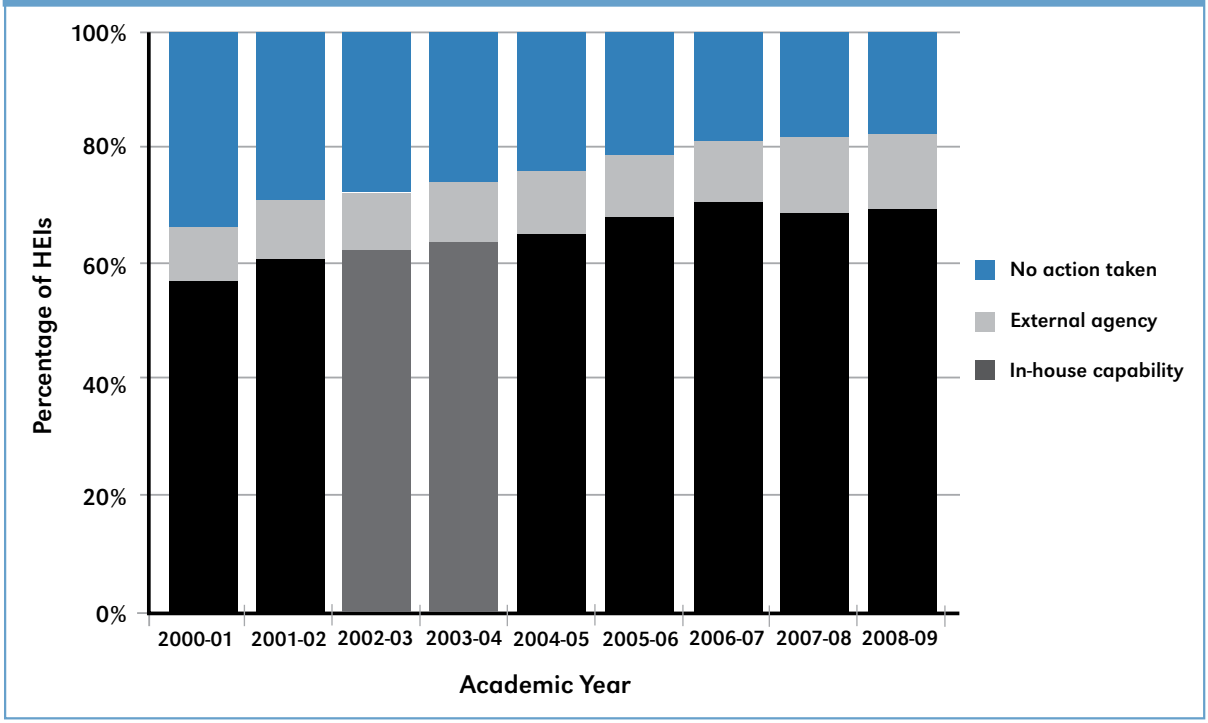
Changes Associated with Decentralisation of Ownership

After this crucial change, some universities remained with or commissioned BTG to look after their intellectual property, while others chose to handle technology transfer locally.

Figure 1. UK Higher Education Institutions Licensing Methods 2000-2009(7)



For example, in 1987 Cambridge gave the responsibility of technology transfer to an existing organisation, the Wolfson Cambridge Industrial Unit using its existing trading company, then called Lynxvale Ltd (now called Cambridge Enterprise Ltd), as the commercial entity to which intellectual property rights could be assigned. In 1988 Oxford set up Isis Innovation Ltd as a wholly owned subsidiary company to carry out its technology transfer.(8)(9)

Establishment of IP policies followed with Oxford putting its first policy in place around 1985 and Cambridge in 1987.

The parallels between the UK and U.S. policy regarding university ownership may have been influenced by the Bayh-Dole Act. Both were driven by a common consideration of optimising the national economic benefits arising from publically funded research. However, around 2000 the UK took a further step by proactively investing in university knowledge and technology transfer. This level of investment was not experienced in the U.S., though some U.S. states launched programmes to encourage economic development in cooperation with their state universities.

The UK Government launched so-called "third stream" funding programmes, alongside those for teaching and research, to "enhance the economic and social benefits of universities by supporting and encouraging knowledge exchange between the Higher Education (HE) sector, businesses, public sector bodies and third sector organisations." These included the Science Enterprise Challenge, the Higher Education Reach Out to Business and the Community and Challenge Funds.(8)(10) In 2000, the Government funded the "Cambridge-MIT Institute" initiative to encourage sharing of best practices in knowledge and technology transfer.(11) Praxis (now PraxisUnico)(12) was one of the outcomes of this programme which has had a national impact on developing, training and advancing the technology transfer profession in the UK and increasingly widely.

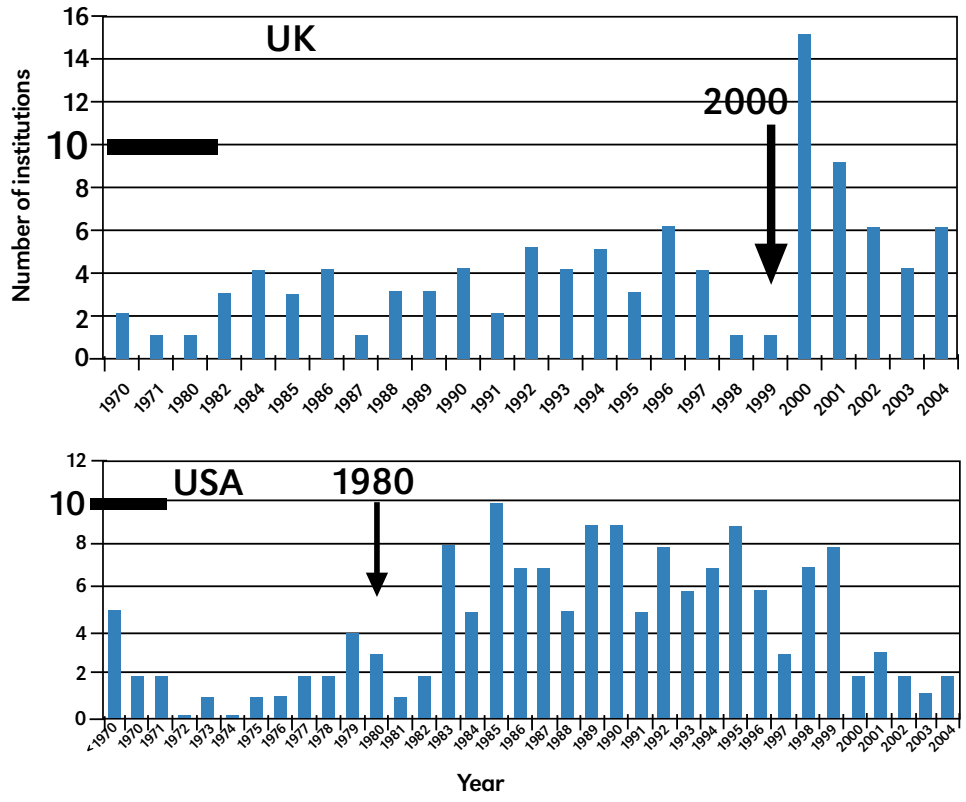
In 2001 these programmes were consolidated into, and succeeded by, the Higher Education Innovation Fund (HEIF) monies which universities could use to support knowledge and technology transfer or other activities that they believed would leverage entrepreneurial activities, industry interactions and economic development.(13) For example, Cambridge uses its HEIF funding to support technology transfer staffing, entrepreneurial learning and outreach programmes. Other universities use theirs for proof of concept and patent funding or to support academic consultancy.

Research by Professor Alan Hughes and his colleagues in the Centre for Business Research(14) found that universities used on average 50 percent of their

HEIF funding to support knowledge and technology transfer staff. The study evidence suggests one of the other impacts has been professionalization of the knowledge transfer function since provision of this funding. Furthermore, they report that around £700 million has been provided to Higher Education Institutions (HEIs) over 2000/01-2007/08 for the third stream mission.(15)

Though decentralisation of ownership of patents to universities occurred around the same time in the U.S. and UK, the main stimulus for knowledge transfer in the UK since 2000, appears to be the investment in third stream activities by the UK Government as illustrated in the chart below.

Figure 2. Number Of New Technology Offices Opened Each Year



Source AUTM, UNICO (16)

Furthermore, as illustrated from the Higher Education-Business and Community Interaction survey (HE-BCI), there is an increase in license, consultancy and spin-out activity following Government investment.(17)

Commonalities, Nuances and Observations

The UK and U.S. universities shared the evolution of title and responsibility to inventions being entrusted them, and similar impacts followed. They also share another aspect critical to a robust environment for university technology licensing: strong programmes for networking and training through PraxisUNICO and AUTM, respectively.

There are also some interesting subtle differences. In our observation, university IP ownership is more complex in the UK than in the U.S. as a result of multiple policies and contractual obligations regarding inventor ownership and management among the various Research Councils and charities. For example, Cancer Research UK owns inventions made with its funding and has its own excellent technology transfer company CRT Ltd.(18) The Medical Research Council (MRC) also has its own excellent technology transfer group MRCT Ltd(19) which manages inventions created in its research facilities (much like the NIH in the U.S.). However, universities manage the inventions made in their facilities by their employees who receive grants from the MRC and yet further arrangements are made if MRC employees are working at a university. Generous revenue sharing arrangements with charities that fund research are not unusual in the UK adding to the complexity of distribution arrangements and loss of operating income to technology transfer programmes. As with the Federal sources of research funding in the U.S., the UK Research Councils delegate the rights and responsibilities for IP commercialisation to the universities expecting economic impact, but leaving the sharing of income to incentivise academic engagement in technology transfer.

Figure 3. Consultancy Income In UK Higher Education Institutions 2000/01—2007/08 (7)

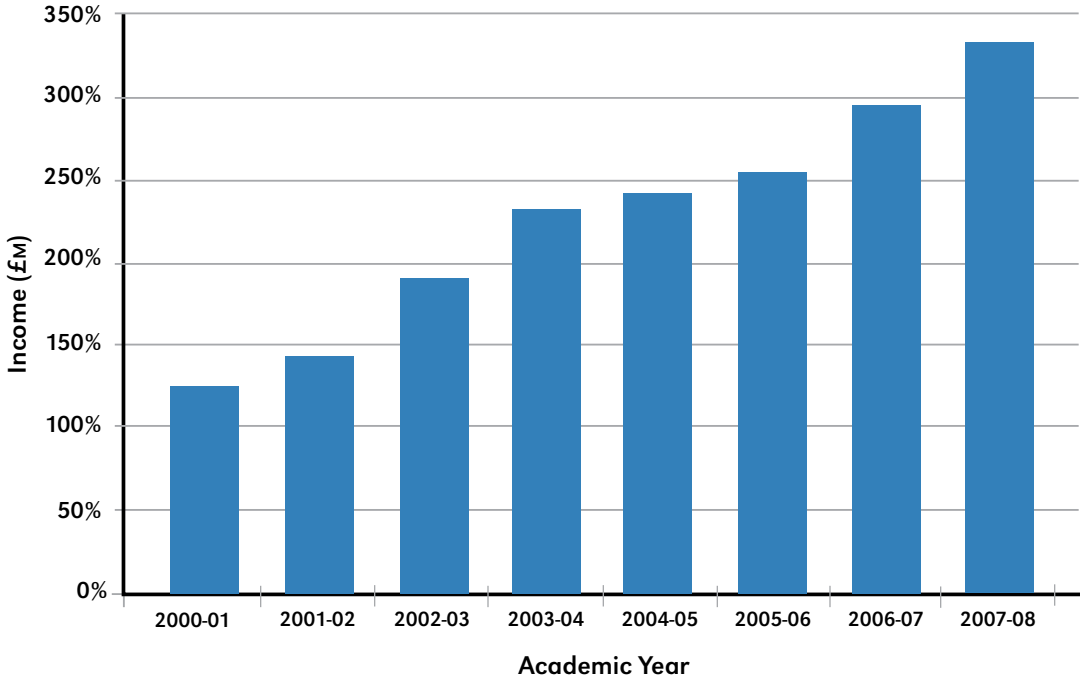


Figure 4. Number of Licenses Granted by UK Higher Education Institutions 2003/04-2007/08(7)

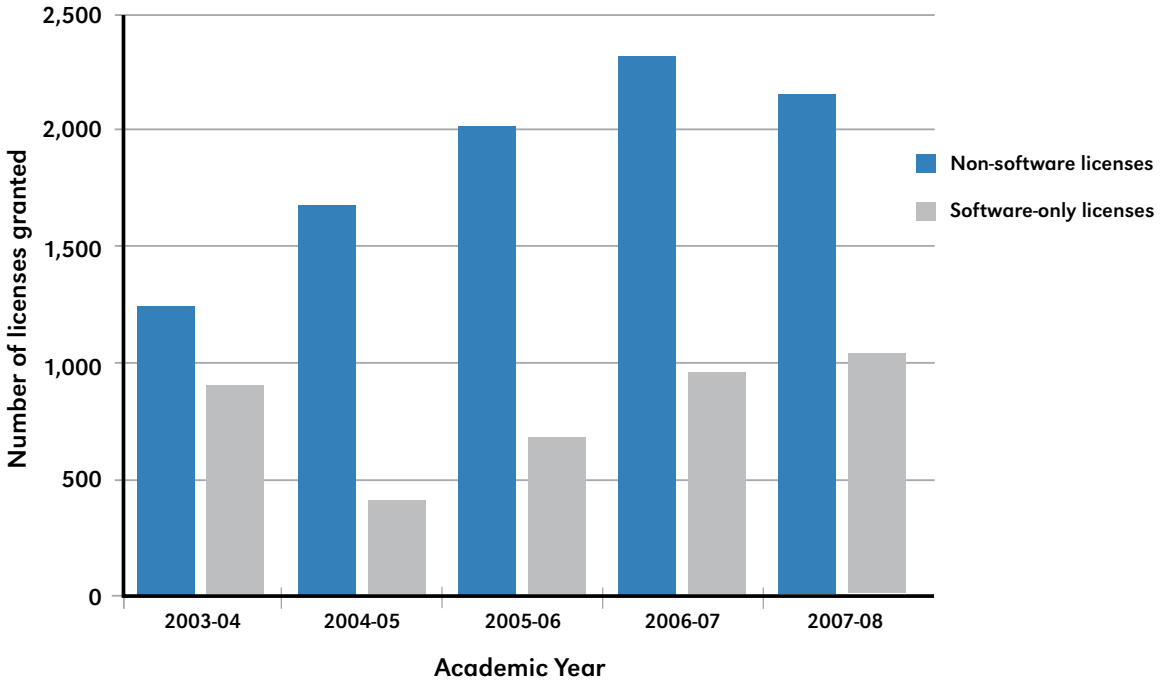


Figure 5. Spin-off Company Formation (With and Without UK Higher Institutions' Ownership) 2003/04-2007/08(7)

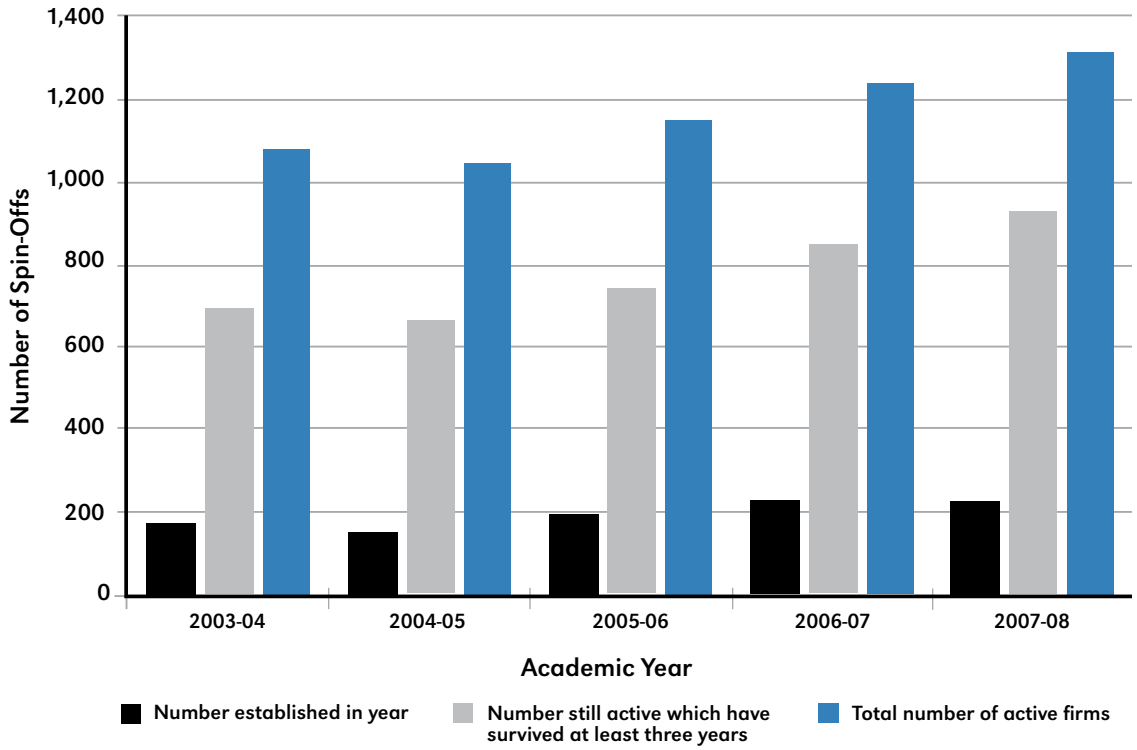


Figure 6. Comparison of Some U.S. and UK /metrics 2007/08(7)

	U.S. Universities	UK HEIs
Number of institutions	157	160
Total research expenditure (£ million)	21,623	4,854
IP income including sales of shares in spin-offs (£ million)	1,039	66
IP income as percentage of total research expenditure	4.8%	1.4%
Spin-off companies formed	502	219
Research expenditure per spin-off (£ million)	43	22

In the UK we do not enjoy the benefits of patent filing grace periods, or patent joint ownership as available under U.S. law (where all owners have equal rights and can act independently, which is not the case in the UK).

University patent policies and technology transfer structures vary across the UK. This provides a benefit in allowing multiple models of technology transfer to be tried simultaneously and contrasts with the more uniform Bayh-Dole influenced U.S. approach (although the attendant opportunity cost of non-uniformity may not be trivial).

For example, Imperial College has raised money for their efforts in technology commercialisation by creating a for-profit company, floated on AIM (a regional stock exchange), which has rights to inventions coming out of the College. By contrast, Cambridge has only recently (December 2005) modified its policy for the University to have the initial right to ownership of registrable intellectual property rights in inventions made by its employees (unless dictated otherwise by research contract terms). The previous relaxed arrangement is credited in part for the robust cluster in and around Cambridge sometimes referred to as the Cambridge Phenomenon. The technology transfer office for Cambridge University, Cambridge Enterprise Ltd, implements the policy with this in mind. There is clarity of ownership, yet flexibility allowing transfer of ownership to

inventors (if they so wish and if this does not conflict with research funder terms). In this way Cambridge Enterprise, The University and individual inventors have the benefit of many resources in the community geared to assisting in commercialisation of university inventions. In practice, very few inventors choose to own the inventions, but the policy has the benefit of assuring that the decision to proceed with Cambridge Enterprise is a mutual one not dictate. On the other hand, the flexibility and choice can have a negative impact on operating costs.

The environment in the UK compared to the U.S. is less litigious and there seems to be more flexibility and willingness to manage conflicts of interest which we believe has facilitated the creation of spin-out companies.

When measuring impact from research, it's our observation that the metrics gathered are much broader in the UK than in the U.S. The HE-BCI surveys attempt to measure over 20 criteria. These criteria include a few of the same metrics to the AUTM survey, but also include community outreach, professional training, collaborative research and engagement of university staff in consultancy. This broader view may reflect a deeper integration of knowledge exchange within UK Government policy and basis for funding. The origins of this more comprehensive approach to impact, and many of the programmes to support knowledge transfer in the UK, are based on regional programmes first carried in Scotland and later adopted more broadly. (20)(21) This broader view of measuring benefits of knowledge exchange has recently been recommended in a European Commission report and discussed as a means of broadening the understanding of impact of universities on the economy.(22)

Some of these more expansive metrics would be difficult to measure in the U.S. For example, U.S. academics consult as a legitimate part of their external activities, but at arm's length from their university employers making it difficult to collect the data. In the UK there are established university services for supporting this activity as a significant and well recognised form of knowledge transfer. In some UK universities it is mandatory for university employees to use such a service or even carry out such activities as a normal part of their duties as a university employee. In others, such as Cambridge, it is optional whether the consultancy service provided by Cambridge Enterprise is used or not. (However, academic consultants are obliged to ensure they differentiate clearly between their university and private activities.)

Conclusion

The UK does not have Bayh-Dole-type legislation, but it implemented and carried out an ownership decentralisation effort that resulted in a similar impact to that in the U.S. from Bayh-Dole. The UK government then invested in knowledge and technology transfer, further establishing and accelerating the development of a variety of means to facilitate the transfer of the results of research and scholarly activities to society. These include not only patent licensing, but spin-out activity, entrepreneurship training, community outreach and (something you don't see in the U.S.) university affiliated programmes to support academics in sharing knowledge through consulting to industry and government: a real-time means to impact society through sharing the latest research outcomes from leading academic experts.

A growing theme from UK Government in these times of spending reviews and austerity measures is that engagement in, and impact from, knowledge and technology transfer is not optional. For universities, which expect to continue to receive tax payer support, it is a survival skill. ■

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**After agreeing to write this I realised I might not be the right person to do it. I work for a significant UK university; however, my technology transfer origins are primarily in the U.S. Though I know a lot about the Bayh-Dole Act, I've had to depend on, and am grateful to, my co-author Richard Jennings and colleagues David Secher, Linda Naylor and Kevin Cullen to educate me about the emergence of university technology transfer in the UK.*