

ACADEMIC SPIN-OFF COMPANIES: MYTHS AND PITFALLS

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We have been working with academic entrepreneurs, in the Universities of Warwick, Leeds, Coventry and Glasgow since the early 1990s. We feel we have learnt many lessons. Particularly, we have discovered that there are many lessons that are not obvious, and many myths about academic entrepreneurs. So we are going to deal with a few controversial issues, and burden you with our own strong opinions.

But first, a little bit about the University of Warwick and Warwick Ventures.

The University of Warwick

The University of Warwick is one of Britain's leading universities, although it is a newcomer, being founded in 1968, at the height of "flower power". It is sited in the green belt to the south of Coventry, a manufacturing city of about 250,000 inhabitants. Not far away are Warwick, the ancient county town, and Stratford-on-Avon, Shakespeare's birthplace.

The University has grown rapidly, and now has over 15,000 undergraduate and postgraduate students and employs more than 3,800 staff across a range of University departments. Its annual income is nearly €300 million.

The University was ranked 5th among the UK's universities for quality of research in the UK Funding Councils' 2001 Research Assessment Exercise. Almost all of the University's academic staff are located in departments with the top research ratings of 5 or 5*. Its total research budget is over €75 million per year. When we are looking for commercial opportunities, the Engineering, Computer Science, Medicine, Biological Sciences, Chemistry and Physics are the most important research centres. The world famous Warwick Business School and Warwick Manufacturing Centre are also of vital importance.

Warwick Ventures

Warwick Ventures is a Department of the University, founded just under two years ago when the authors joined the University. Its mission is to identify and exploit commercial opportunities arising from research in the University. So far, we have looked at about 120 such opportunities. Most we are still working on, but we have managed to get create 12 spin-off companies so far, raising over £1 million of venture capital and grants for them. In addition, we have filed 25 new patents, and found licensees for four inventions.

Warwick Ventures is located on the Science Park, so it is clearly distinguished from the rest of the University administration. The ten staff are not academics, though they share eight bachelors degrees, three MScs, two PhDs and two MBAs. Their experience is primarily in business management in a wide variety of commercial companies.

What we have learnt

Of course, we have learnt lots of obvious things. How to spot the obvious losers. How to write a convincing Business Plan. How to sort out tricky complications in intellectual

property. How to find venture capital. How to create a balanced company board. You can read about these things elsewhere. We want to talk about some of the more controversial things, where we might disagree with you, the reader.

Do you agree with any of these statements? We do **not**!

1. Licensing is a more effective means of technology transfer than spin-offs

In many universities, especially in the US, but also in the UK and elsewhere in Europe, the Technology Transfer Office is mainly occupied with licensing. Spin offs are treated with suspicion, as too complicated compared to a nice quick licence. In addition, spin-offs can produce conflicts of interest, where the academic is also a company shareholder and board member. It seems safer for the university to keep its hands off, and just sign a simple licence and sit back to collect the royalties.

In our experience, the main problem with this attitude is that most University research doesn't usually result in a nice neat invention, ready for a nice neat licence. University research usually produces something that works sometimes in the laboratory, if the professor and his technician are try really hard, but significant development is necessary before it could be released onto the market. And unfortunately, most companies don't want to undertake this development work. It seems too risky, and too expensive. And, of course, the fact that they will have to do all the development work means that they are unwilling to pay much to the university. The Association of University Technology Managers (AUTM) survey of US universities showed that the average advance payment on their licences was on \$35, 000 (€40,000). We get one invention per €1.5 million of research spend, so to part with the best ones for only €40,000 is hardly an impressive performance.

Of course, not all companies are unwilling to take on undeveloped inventions. The pharmaceutical industry is an exception, which is why the same AUTM survey shows that over 80% of universities' licence income comes from life science inventions. But even the pharmaceutical industry seems to be backing off, requiring new lead compounds to have reached Phase 2 trials before they are interested. And as for large swathes of the engineering, chemicals and information technology, forget it. If it isn't fairly well developed, then they don't want to licence it.

So, in many cases a spin-off company is a necessary step to develop the product, and demonstrate its market, to take some of the early-stage risk out. The company can raise the funds to do this by selling some of its equity to venture capitalists, or through small business grants. The licence option is still open. Once the product is fully developed, and customers are clearly keen on getting it, larger companies will suddenly become very interested, and will start to offer much larger sums of money for exclusive rights. And, of course, the company still has the option of turning down these offers, and selling the goods or services themselves, building up the value of the company so it may eventually be worth millions to the shareholders.

2. But surely you can fully prove the inventions in the university laboratory rather than setting up a company

In our experience, this is a mistake. The development phase is expensive and risky. There are venture capitalists, business angels and government grants that can cover these expenses if a small company is doing the development work, but if development happens in the university, then usually it is the university that pays the cost. Many development programmes fail, and the investment has to be written off. Venture capitalists expect this,

but universities seem to want to blame someone when large sums of money have to be written off. Post mortems follow, and the whole thing leaves a bad taste which suppresses future innovation and enterprise.

It is really better for the university to give up some share of the proceeds of its invention, in order to minimise its risks and pass the financial burden onto others.

3. Companies are difficult and expensive to set up

Not in the UK, they aren't. It costs us €200, and takes a week. Any other complications are purely voluntary. If it is not equally easy in your country, then complain. Cheap and easy company formation is a vital part of the entrepreneurial culture.

4. Why bother? Universities have never made lots of money out of spin-offs anyway

Oh yes they have! There are now lots of examples in the UK, but this is one of the best:

IMPERIAL EARNS £10.5 MILLION FROM SPIN OUT

The Times and Daily Mail reported that Imperial will receive over £10 million from sale of part of its equity stake in Turbo Genset Ltd. Only 25% of the College's holding in Turbo Genset has been sold - in a private placement, in advance of the company's listing on the London Stock Exchange on 11th July - so Imperial could realise a further £30 million plus, if it divests its remaining shares.

Turbo Genset's market capitalisation will place it in the top 200 UK companies. The company was formed in 1992 with help and support from IC Innovations, the College's technology development subsidiary, (then named IMPEL), and Susan Searle, Innovations' Director of Science and Engineering represented the College on the company's board, until its first public listing. The company retains very close links with the College, contracting ongoing research and development from the Mechanical Engineering Department where the technology originated, under the supervision of Professor Colin Besant, who combines his academic role with that of Chairman and Chief Executive of Turbo Genset.

Imperial holds equity in a further 36 spin out companies at earlier stages of formation and development, with even more in the pipeline. Innovations has helped establish all these companies by protecting the intellectual property underlying their technology base, by assisting in developing their commercial strategies, and by guiding them through the College's approval mechanisms. In conjunction with IC Company Maker, its own subsidiary, it works with the academic entrepreneurs and their commercial partners to develop business plans and secure finance. In addition, Company Maker provides mentoring and 'virtual incubation' for the new ventures, using a network of blue chip service providers including legal, tax, accounting and management advice.

The majority of these new companies have yet to be publicly traded, but other equity sales of the scale of Turbo Genset are fully anticipated.

5. If Spin-offs are such a good idea, we shouldn't involve Venture Capitalists and similar sharks. The University should make the whole investment?

We have found that in practice there are lots of reasons why early-stage venture capital is a good idea, and investment by the University is a bad idea: Amongst these are:

- No reasonable person can really think that university administrators are better judges of which spin-off are the good, the bad or the ugly than experienced venture capital executives. Universities are very likely to be influenced by the professors academics standing, and the elegance of the technology, while the venture capitalists have become very accomplished at assessing markets, cash flows, management teams and milestones. There may be a case for the university investing alongside the venture capitalists but alone.....never!
- Anyway, universities have limited budgets. They may be able to find €100k, afford, but what about €1 million, or €10 million? Early-stage investment by the university just puts off the day when the company must become "investor ready", by developing

plans which venture capitalists will accept. As part of our scheme for helping companies to become investment ready, Warwick Ventures launched and are managing Connect Midlands (see box below)

- Having an outside investor is a good discipline for the companies. The transition from academia to business is not easy, and requires individuals to develop new attitudes as well as new skill. The venture capitalist will make it clear at all stages that they are there to make money, not to advance science or to given the inventors and management a better life. They will thus impose a discipline which the university could not possibly impose, and thereby make the spin-off company more likely to succeed as a business in the long-run.



The Connect Midlands mission is to nurture the development and growth of technology-related enterprise in the Heart of England, by connecting entrepreneurs with the resources they need to succeed. Connect Midlands will focus its activities on the Midlands, but will operate beyond the geographical boundary. It is part of the international Connect network, which includes eight Connect programmes in the US, UK and Scandinavia.

The University of Warwick, which has created Connect Midlands, has identified a particular need to establish a platform to bring together companies in need of second stage finance, alongside potential finance providers. It invested pump-prime funding to establish Connect Midlands, which was launched through an Investment Conference on 8th –9th November 2001. The two-day launch event was be a major networking opportunity which offered investors and 25 technology based ventures, an opportunity to broker deals and network over two days of exceptional conference content.

Connect Midlands will work to fulfil the needs and aspirations of emerging technology companies through access to an outstanding network of investors, business professionals and entrepreneurs. Working with this network, companies will be able to source expert advice and key resources, including finance. Connect Midlands' future events and activities will be designed to offer tangible and practical value, focusing on the investment process.

6. The University should take extra care when setting up companies, so as to reduce the rate of failure

Again, this statement suggests that the university has some special expertise in judging the factors which are likely to lead to success or failure. However, experience shows that many spin-offs will fail, irrespective of how much effort is put into the creation phase. Markets prove to be smaller than expected, or less willing to spend. New competitors or technologies may emerge. Unanticipated faults in the management may be exposed by the rigours of trading, or key people may leave.

If there people who can consistently distinguish the success and failure factors, they are more likely to be found in the venture capital companies. There is thus a strong case for the university technology transfer team stopping fairly early in the business planning process, and putting the proposition to potential funders. Their reaction can then determine the next steps. If the funders are ready to invest at that stage, then the university's job is finished and it can move on to the next opportunity.

7. Spin-off companies need to stay close to the University for several years

Close geographically, yes, though if the company is just off the campus on a Science Park it is better than actually within the Department. If the university academic department offers free space to the spin-off company, it is usually intending to be kind, but it is actually being cruel for the following reasons:

- Free space is a bad discipline. If the company grows it will need to rent space at a later date, so it should get used to the idea that it has to pay this overhead, and build it into its cost and pricing structure.
- The company staff need to know that they are different from the academics. They should be different in salary, motivation, hours of work and many other cultural ways. To mix the two together in adjacent offices will produce tensions and harm both.
- Limited free space can act as a serious constraint to growth, as the company managers will resist taking on additional work and staff that means that the whole enterprise has to move out and pay rent.

In Warwick, we have taken a hard line on this issue. The basic position is that new companies are not offered space within the department, but directed to the Science Park nearby. However, for some Biology and Chemistry spin-outs, this has seemed excessively harsh, as they have requirements for laboratory facilities which are not available on the Science Park. In these cases, we have provided them with a lease with a maximum two-year term, for a maximum of four staff. If the company exceeds either limit, then they must move out. Finally, we charge them a rental which is deliberately set high, so that they have a financial incentive to save annual rental as soon as they can afford the fitting-out costs of Science Park space.

Close administratively? Definitely not! If the company starts getting locked into the university's personnel policies, purchasing, accounting processes or any of those administrative aspects, it will be fatally damaged. The university's methods have developed for a large, conservative, slow-moving organisation. We want our spin-off companies to become large, but they have no chance of doing so unless they are taking risks and moving fast in their early years.

Therefore, at the point of company formation, we force it to become entirely separate from the university's administrative processes. We avoid allowing them to second in university staff. They have the freedom to set their own salary scales. They run their own payroll and accounts, though we may help find them outside agencies who can help them. They get their own websites, rather than a section on the university site. They open their own accounts with suppliers. We do not encourage them to use the university's bankers, insurers, lawyers or accountants.....indeed, we direct them to other competent organisations. In all these ways, we ensure that the company truly acts as independent, and they is little chance of the huge bulk of the university suffocating the fledgling business.

8. Having lots of spin-off companies will be a big administrative burden for the University

But surely, we hear you say, having lots of spin-off companies is still going to be a big administrative burden for the university.

Not unless the University gets over-involved, we say. In Warwick, we have ensured the maximum separation between the university in the following ways:

Academic Spin-off Companies: Myths and Pitfalls

- The University holds a maximum of 24.9% of the voting shares. In English Company Law, this means that the University does not have a controlling interest, and need not mention the company's activities in its annual accounts.
- While we insist on the University's right to appoint a Director to the Company Board, we do not take up this right in practice, but send an observer when convenient.
- The Shareholders Agreement obliges the company to send its annual Business Plan to the University, but doesn't require them to get the University's approval.

This means that the University is not taking responsibility, in any way, for the activities of the company, and can safely let it get on with succeeding or failing, as may be. And because we take no responsibility, the company is no great burden to us. Just turning up at a Board Meeting every couple of months and reading the Board reports is not much work. And if we are too busy for even that much, because we are concentrating on even more new spin-offs, then it doesn't really matter.

Our spin-off companies are a little like cruise missiles. We put a lot of effort into building them and firing them, but once fired, they either guide themselves to their objectives, or they don't. We don't even try to effect the outcome, but we hope our companies will grow rather than explode!

9. The University should help struggling spin-offs get over their difficulties

No, no, no! Let them sink every time! If the company is not succeeding, and cannot find further funding from commercial sources then accept the message it's a failure, and the University should keep well away.

Of course, having kept good administrative separation between the university and the company is very important in these cases. If a failing company sinks, it is very important that no parts of the university get dragged down too.

10. Having shareholdings in companies will be a real financial risk to the University

Not in English law. Shareholders are not responsible for the management of the company. It is the Directors of the company who are responsible, and if the company has been fraudulent or grossly negligent, then the Directors are liable for damages, or may be fined or sent to prison. This is a good reason why the university should not appoint a Director. All the shareholders lose is their original investment. If the shareholding has been acquired by the university not for cash, but for making the intellectual property available, then the university has even less financial liability: at worst, the intellectual property is lost. In Warwick, we usually invest less than €1,000, and never more than €10,000 in cash. Furthermore, whenever possible, we license the intellectual property, and the licence includes a clause which says that if the company goes into liquidation, the licence automatically terminates, so the University automatically gets back its intellectual property. This is the best way for the companies with modest funding. For those which get substantial venture capital, the investors will normally require that we assign the intellectual property, which means it passes permanently to the company. So, sometimes we may lose the intellectual property, but we can never lose more than a small amount of money.

11. There is a real shortage of seed-corn funding for spin-offs.

Not any longer in the UK. We now use three schemes, Spinner, Smart and the Mercia Fund, to find our seed-corn funds. These are described in the box below. Venture capitalists and business angels are also becoming more interested. In the last 18 months we have managed to raise over €1.5 million for seven spin-off companies, and we expect to beat that figure over the next 12 months. We have to admit now that if we can't raise a few €100,000s for one of our spin-off companies, then it probably isn't such a good idea after all. € millions are harder to get, but we think we can soon get good at that too.

SPINNER

This project, worth €9.5 million over 3 years, aims to increase the number of spin-off companies from the eight universities in the West Midlands from 10 per year to 30 per year. It started on January 1st, 2002, and is providing funding for three activities:

- Employment of 16 new Business Development Managers across the eight universities
- Consultancy advice from Warwick and Birmingham Universities, which are the more experienced at technology transfer, to the other six universities.
- A Small Grants Fund, of €3 million, which will give grants of up to €25,000 for “pre-seedcorn” activities such as initial patent filings, intellectual property audits, market research, business planning and small scale prototype building.

SMART

This is a well established UK Government scheme, which provides grants of up to €73,000 for feasibility studies and prototype building. The grants are aimed only at small and medium enterprises, so we can only apply once we are committed to creating a spin-off company. We have found that the success rate for applications from university spin-off companies is very high (over 80%), which means that it is a fairly reliable source of funds for the “development gap” between research and exploitation.

THE MERCIA FUND

This seedcorn investment fund was created in 2000 following the national “University Challenge” competition. The 16 funds across the UK now have €130 million to invest in university spin-off companies. They all have similar rules, including a maximum investment in any one company of €400,000. The Mercia Fund, which has €6.5 million to invest, was created by the Universities of Birmingham and Warwick, but is also open to other universities in the region. It has invested about half its funds into ten spin-off businesses over the last 2 years, in return for equity in the companies, and is proving to be a very effective means of moving the companies up to the stage where they can raise substantial venture capital. National figures show that over 200 spin-off businesses have now been supported, and some of the investments are already providing capital growth for the Funds.

12. Academics make bad entrepreneurs

Rubbish. Some of them make very good entrepreneurs. They are intelligent, resourceful and have unique ideas. Furthermore, their experience in lecturing to students means that they can explain their ideas really well, and so make excellent salesmen. Finally, they can be really passionate about their innovation, and will work excessive hours to see it through.

What most academics lack is the more mechanical business skills. They don't understand the difference between cashflow and profits. They have no experience of tax, contracts or company law. Most have never read a good Business Plan, let alone written one. Their staff management experience is sometimes very limited, and they are not used to negotiating with customers. But these are all very straightforward business skills, so we can compensate for their weaknesses, ensuring that their strengths can shine through.

13. Universities shouldn't try to own their academics' Intellectual Property

Wrong! Developing intellectual property requires significant initial expenditure on, for example, patenting, market research and business planning. A University technology transfer programme has the money to do this, while the academic usually doesn't. Clear ownership by the University, and a clear programme, and funds, for development, ensures that the intellectual property, if at all possible, is developed and used rather than wasted. Of course, the financial benefits should be shared between the university and the academics, or the academics would soon lose enthusiasm. And sometimes, the university may wish to give up, but the academic wants to continue, in which case it is fair for the university to assign the intellectual property (though I have never come across such a case where the academic made a success of it).

Conclusions

So, there are 13 statements that we disagree with. We are not just trying to be controversial. We strongly believe that the philosophy behind our beliefs is vital in ensuring consistent success in academic spin-off activities, and will strongly benefit the academics, the university and the economy as a whole. So putting the positive side of our philosophy:

- The University should take control of the intellectual property
- It should concentrate its efforts on company formation, not company management
- Provide lots of management support to the academics in the first year or so, but then phase out university involvement.
- Make the new companies stand on their own feet, financially.
- Look for outside investment funds early, and listen to the message that the potential investors give you.
- There won't be much financial benefit in the first few years, but from 5 years onwards, the benefits can be very large.