THE SPINOUT JOURNEY:

Barriers and Enablers to Gender Inclusive Innovation

SUMMARY REPORT

OXFORD BROOKES UNIVERSITY

UKRI — Engineering and Physical Sciences Research Council

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ACKNOWLEDGEMENTS

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About this report

This summary report provides an insight into the diverse experiences of women and men researchers who have successfully founded a university spinout company. A full report is available online at **brookes.ac.uk/women-and-spinouts**

This research is part of a wider project, funded by the EPSRC's *Inclusion Matters* initiative, looking at the participation of women scientists, engineers and mathematicians in university spinout companies. As highlighted in our previous report, only 13% of spinout companies across the whole of the UK have a woman founder (Griffiths and Humbert, 2019). This cannot be solely attributed to the underrepresentation of women in professorial roles in STEM disciplines. As this study shows, researchers may spinout at different stages of their careers and the majority of spinout founders in our sample could be classed as early- or mid-career academics.

This research charts founders' spinout journeys from the early days of establishing the company through to developing the spinout and reflecting upon challenges and successes. It compares the experiences of women and men academic founders to better understand where women may be encountering gender bias and have to overcome additional challenges. This approach has enriched empirical knowledge around women's experiences of academic entrepreneurship but also highlighted areas for development that would enhance and improve the spinout experience for all founders. This report cannot provide a blueprint model for institutions on spinouts but offers recommendations that institutions should consider if they aspire to create

13% of active UK spinouts are founded or co-founded by a woman or a mixed gender team.

an inclusive environment to support academic entrepreneurial activities and to develop a more gender inclusive innovation ecosystem.

METHODOLOGY AND RESEARCH SAMPLE

This study is based on qualitative data from 35 interviews undertaken with spinout founders (20 women and 15 men) and 8 interviews with key informants, including people working in technology transfer, knowledge exchange and commercial law. The spinout companies are all based within the science, technology, engineering and mathematics fields, although many of the businesses utilise cross-disciplinary knowledge in the creation and development of their products or services. Of our sample of women and men founders, 77% of the founders' research originated from Russell Group Universities. This reflects the institutional polarisation of the UK

77%

of founders in our sample originated from Russell Group universities.

spinout landscape, as identified in this project's previous report (Griffiths & Humbert, 2019).

The average age of women in our sample was 45 and the average age of men was 46. UK wide, the average age of a woman officially incorporating a spinout company is 39 and the average age of a man incorporating a spinout company is 43.[1] The age range of women interviewees was 28 to 73 and for men it was 30 to 77. In total, 31% of interviewees were senior academics (professor or head of department/faculty) at the time of spinning out; however this varies significantly between genders: 20% (n=4) of women were in these roles compared to 47% of men (n=7). In our sample, 45% (n=9) of women were Early Career Researchers (ECRs) at the time of spinning out whilst this was true of only 20% (n=3) of men. Of the women interviewed, 50% still retained academic roles (n=10), whereas almost three quarters (73%, n=11) of men interviewed retained their academic jobs. Our sample suggests a trend for men participants to be the more senior academic in the initial founding team, co-founding with a PhD student or postdoctoral researcher. While some of the women we interviewed also held a senior position within the founding team, the majority co-founded their spinout with an academic further along in their career than they were. Future research could explore whether these gender differences may be observed at a larger scale.

1/The analysis of men's age at time of incorporation was done by taking a randomised sample of 100 male-founded UK spinout companies from the Beauhurst database and subsequently using the database, alongside research through university and company websites, to identify the founding members. The dates of incorporation for the spinout companies and dates of birth of founders were located via Companies House.

20 women and 15 men were interviewed.

31% of interviewees were senior academics at the time of spinning out.

4 women founders

7 men founders
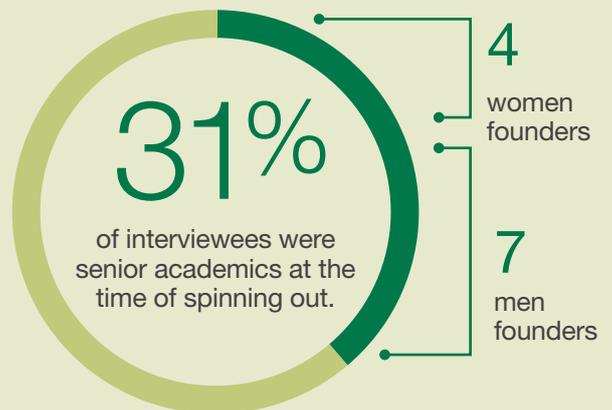
45% of women and 20% of men were Early Career Researchers at the time of spinning out.

Summary of Key Findings

The findings of the qualitative research have been structured in a way that best represents a typical spinout journey, beginning with establishing a university spinout and concluding with reflections from the perspective of a successful spinout founder. Direct quotes from the interviews have been used to illustrate, through research participants' own voices, some key points that have emerged from this study.

ESTABLISHING A SPINOUT

MOTIVATION TO SPINOUT

Women and men founders in our sample were similarly motivated by their strong desire for research to have practical applications to address 'real world problems' and benefit individuals and society: *It's every academic's dream to have your technology applied to products'* [Woman founder].

Some of them were also driven by the quest for *'freedom and flexibility'* which they could not achieve in their academic careers. Although they acknowledged that managing a business was highly demanding, some women founders reported that the spinout – compared to their academic research – offered them greater flexibility, more autonomy and more control to manage the needs of developing a business with their family responsibilities.

'When I came back from maternity leave for the third time I was just really wondering how I was going to juggle everything. I said, [to my colleague] "I'm not sure if I'm going to come back to work. I think maybe I'm going to have a bit of a break for a while". He said, "Why don't we think about applying for some funding to look at commercialising the research?" I thought, ok, I could probably manage that if it was more flexible, if I could be at home a bit more and do it a bit more flexibly.' [Woman founder]

Greater freedom and flexibility however, was also valued by founders without childcare responsibilities who appreciated more autonomy over their working time and place, albeit for different reasons.

This finding suggests that academic careers are very rigid and institutions need to provide space and opportunities to accommodate inclusive and alternative career pathways, including spinouts, which will accommodate caring responsibilities and other life priorities.

INSTITUTIONAL SUPPORT AND THE ROLE OF TECHNOLOGY TRANSFER OFFICES (TTOs)

TTOs play a crucial role in helping researchers to create spinouts. Contrary to existing literature (Murray and Graham, 2007; O'Shea, Chugh and Allen, 2008; Abreu and Grinevich, 2013; Stagars, 2015) which suggests women need more support than men from TTOs to commercialise their research, we find that access to support from TTOs was similar for all founders irrespective of gender. The quality of support from TTOs varied across institutions, suggesting a different appetite for supporting these enterprises, evidenced by the degree of spinout activity within a university. This diverse landscape is in alignment with findings from our previous report, which shows a polarisation of the university innovation ecosystem with 70% of spinouts originating from Russell Group universities (Griffiths and Humbert, 2019).

Thus, opportunities for academic researchers to commercialise their research largely depend on the institution they work for. We also find that patenting inventions – sometimes a requirement for spinning out – has been reported as a particular barrier to establishing a spinout by mostly women and especially younger Early Career Researchers (ECRs), who report challenges in convincing institutions to invest in their ideas.

> *'So, our first thing that we had to do was to file a patent and this can be a barrier because the university pays for this and you have to prove to the university that this is worth doing and it took a long time to convince the university that we had something worth running with.'* [Woman founder]

This suggests that institutional processes around research commercialisation could do more to recognise these intersectional inequalities and ensure younger, less experienced women researchers are equally supported at the initial stages of enquiry.

BUSINESS EXPERIENCE, TRAINING AND INCUBATORS

Lack of business experience is a common challenge for all the founders in our project, irrespective of gender, challenging existing literature (Rosa and Dawson, 2006; Zalevski and Swisczowski, 2009; Abreu and Grinevich, 2013) that frames this as a women-only issue.

'I think at the time I was the first spin-out from [my university] that had just been done by literally someone coming out of their PhD so I very much felt like I was thrown in at the deep end and trying to stay afloat.' [Woman founder].

More senior and experienced women founders felt that the transferable skills they had acquired during their academic career were sometimes underestimated in the business context, with some highlighting the similarities between managing a research group and running a spinout company.

'I think because, as an academic, you have to be used to multitasking all the time, you've got to balance your research group on the one hand, your teaching, your administrative commitments…more and more you've got to juggle your own finances within your academic group, you have to be planning a year ahead, you have to be planning five years ahead and all those things are totally relevant to the sort of skills that you need to bring to bear on a commercial project.' [Woman founder]

Several founders benefitted from attending incubators and there is evidence of some initiatives actively promoting inclusive spaces for women and ethnic minorities. As well as designated spaces, this can also simply mean ensuring diversity in their role models and mentors. However, some interviewees report that not all incubators feel like inclusive spaces so it is therefore important to share more good practice in this area.

DEVELOPING A SPINOUT

FINDING THE RIGHT PEOPLE AND ESTABLISHING ROLES IN THE COMPANY

Finding the right people to work with was a challenge for both women and men founders. Founders agreed that any new senior appointments should have not only commercial expertise but also be trustworthy and share the founder's vision for the company. Ideally, founders and future board members would also share a 'chemistry'.

'I think building a business team and engaging people that truly buy into your vision is absolutely critical to success. And then of course they've got to be the right people and the right people at the right time.' [Woman founder]

Connections for finding new team members could come from the researchers' own networks, but often TTOs and senior advisers would suggest potential candidates. However, there is an unconscious bias caveat since trying to find the 'right people' may result in finding 'people like us', rather than creating a team with diverse backgrounds and expertise.

Some women founders noted that as teams and executive boards increased in size, their influence within the spinout company became diluted. The experts brought in to advise and ultimately lead the spinouts tended to be (older, usually white) men and there were some stories of women feeling sidelined from decision making, a problem that appeared to be amplified by the intersection of gender and age.

FUNDING AND INVESTMENT

Several founders were able to access public funding at the early stages of spinout development, often in preparation for or alongside seed funding. Founders offered examples of how public funding can be used as leverage to promote greater equality and inclusion, such as a recent requirement in some UKRI Innovate UK grants where companies demonstrate how they will promote gender equality and social inclusion. These initiatives are to be encouraged but on their own they are not enough to challenge the stereotypes

> ‘I like the fact that my name doesn’t give away if I’m a man or a woman so by default they expect a man coming to talk about oil and gas.’
>
> Woman founder

and masculine culture present in the wider innovation and commercialisation ecosystem.

In agreement with much of the literature, several women and men founders identified the investment community as being highly male dominated. Many women perceived investment as a gender-biased environment with some feeling their gender had put them at a disadvantage.

> *They were all men – there were a couple of women in the room but they were doing the administrative roles, so they were keeping minutes and they weren’t the actual people who were making the decisions. […] When I walked in [the investors] were just on their phones, they didn’t even look up. They didn’t introduce themselves, it was just a really bad experience from start to finish […]. I had my confidence knocked by how dismissive they were when I came into the room, and then the first question was, “Why are you even here?” I could just feel myself [deflate], and after that I just couldn’t seem to pull myself out of it to give decent answers, I really had my confidence knocked. […] One of the guys in the first pitch actually sent a Tweet whilst I was pitching […] it*

> *was taking the mickey out of what I was doing and it was just so rude.’ [Woman founder]*

Conversely, we had stories of women who felt gender, particularly when combined with other protected characteristics, actually worked in their favour.

> *‘I like the fact that my name doesn’t give away if I’m a man or a woman so by default they expect a man coming to talk about oil and gas...and a woman comes. So, I take that as a good thing because they will remember me. And I find myself, in many cases I’m the only one or one of very few women pitching if it’s a pitching event.’* [Woman founder]

Although no conclusive evidence of gender bias can be drawn from the accounts in this study, these concerns cannot be dismissed; especially when considered in conjunction with studies (Minniti, 2009; Penningtons Manches, 2017; Malmstrom et al., 2018; Rose 2019, Griffiths and Humbert, 2019) that show women founders getting less funding than men. These findings suggest that the investor community must continue to work towards greater diversity in an effort to ensure inclusive and fair distribution of funds.

SUCCESSFUL SPINOUTS

WHAT MAKES A SUCCESSFUL SPINOUT?

Subtle differences emerged from women's and men's discourses about what makes a successful spinout company. Women tended to be more conservative than men in their ambitions, with 'survival' being considered a legitimate measure of success. This may be modesty or lower confidence, but could also mean women are more realistic in their expectations, having faced more challenges during their spinout journey. Men were more likely to cite success in terms of financial gain but there was a general consensus amongst all interviewees that whilst success can be financial to some degree, seeing their idea make a difference in the world would be a sufficient reward.

'I know [my institution] would say a successful spinout is floated on the stock exchange, that's success, isn't it? But to me, I think it's also about making a difference in the world.' [Woman founder]

There was also general coherence between women and men when asked to describe the attributes of a successful spinout founder. These attributes often took the form of transferable skills, such as good time management and the ability to multitask. Others were framed as competencies that could be learned but were perhaps deemed more inherent, such as having good social skills to network effectively and deal with multiple stakeholders. Women were more likely to identify with words such as 'resilience' and 'determination', which, again, may signal that they have faced more challenges during their spinout journey.

'Resilience! Because it's not going to be easy. You're going to get told no a lot! And often it won't be your fault or anything to do with the quality of what you're doing. So resilience and persistence.' [Woman founder]
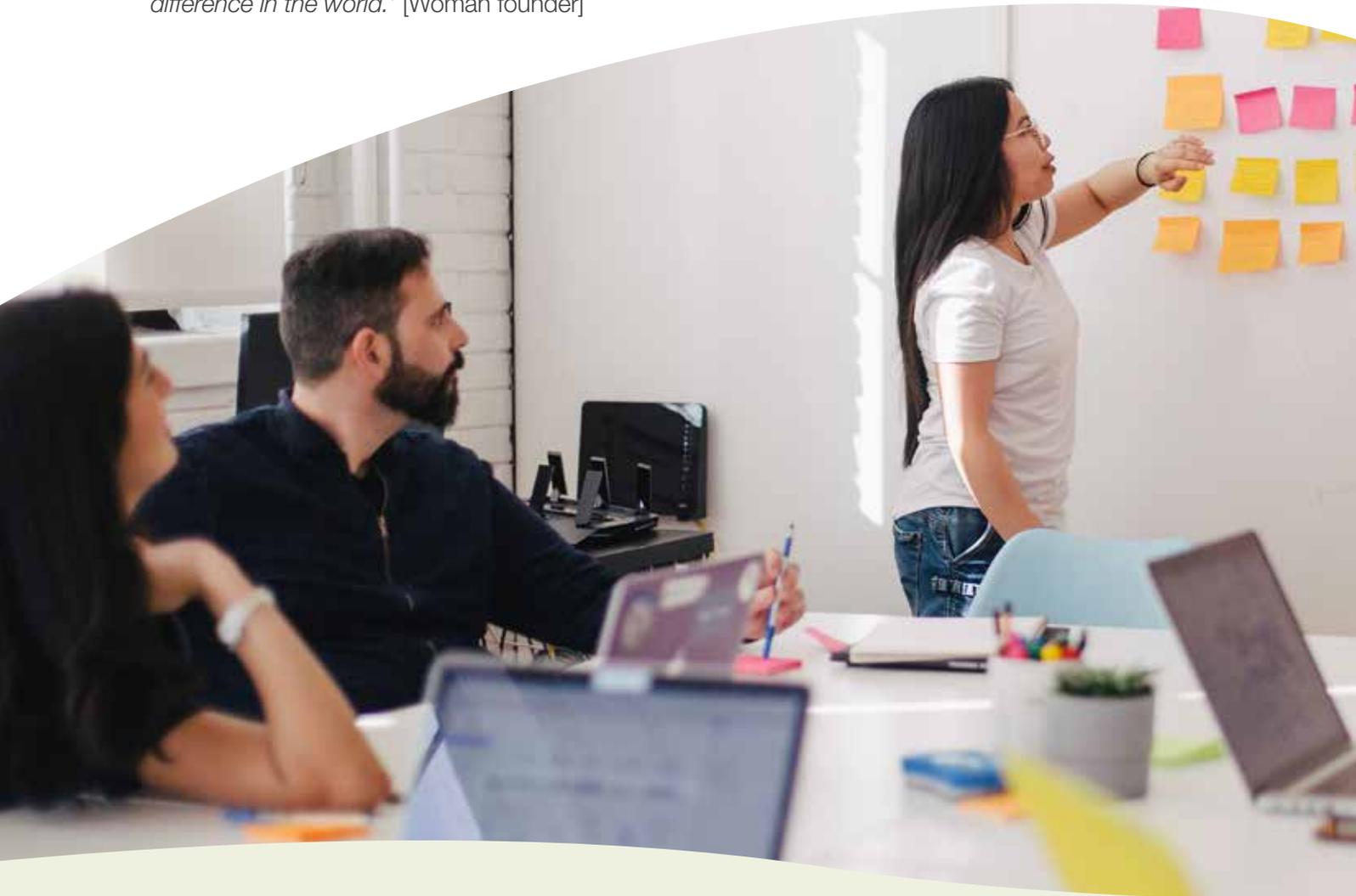
'I know [my institution] would say a successful spinout is floated on the stock exchange, that's success, isn't it? But to me, I think it's also about making a difference in the world.'

Woman founder

PERCEPTIONS OF RISK

Discussions with interviewees around the theme of risk suggest that perceptions of risk are not necessarily influenced by gender but rather by a range of other factors, including career stage, family influences and sometimes other very personal circumstances. For example, founders who created a spinout while already established in their career felt that the risk of spinning out was limited, as their current academic job provided a guaranteed income and a safety net.

'In a sense being an academic is the safest form of entrepreneurship that you can undertake, because you are paid a salary, and you can go and be entrepreneurial [...] you haven't got to give up a job.' [Man founder]

This offers a more nuanced understanding of academic researchers' approach to risk and challenges existing literature, which positions women as more risk averse.

The nature of risk was found to evolve across the spinout journey. The majority of founders felt that financial risks were greater when establishing a spinout, while mature spinouts had risks associated with employing staff and increasing the profile of the company.

'It is a public company and it is very public and if you fail you're going to fail big style' [Woman founder]

Several founders also commented that they felt there was a certain degree of risk aversion within UK institutions and the wider ecosystem, citing the USA as a much more supportive policy environment for fostering academic entrepreneurship.

'In a sense being an academic is the safest form of entrepreneurship that you can undertake.'

Man founder

'He drew me in like a dark colour with a slightly hairy leg, a very weird leg, and I look kind of fat with a lab coat and nerdy pens in a pocket.'

Woman founder

GENDER STEREOTYPES

On the whole, women founders did not necessarily see themselves as having encountered gender bias along their spinout journey, but often their narratives suggested otherwise. Most notably, some women had been subject to sexism and stereotyping, in particular with regard to their appearance and what they should wear. There was also some evidence that these gendered stereotypes intersected with racial profiling, exacerbating the issue for women from ethnic backgrounds.

'He drew me in [a cartoon] like a dark colour with a slightly hairy leg, a very weird leg, and I look kind of fat with a lab coat and nerdy pens in a pocket, like it's just a stereotype and the idea of what a female scientist is meant to look like.' [Woman founder]

A few women also reported being perceived as cheating their way to success by virtue of their gender alone. There was a collective agreement among women and men founders alike that such stereotypes were not only inaccurate but harmful to future generations of girls considering science and entrepreneurship.

WORK-LIFE BALANCE

Women and men founders both acknowledged that the demands of running a spinout company were often incompatible with a comfortable work-life balance. In contrast to pervading narratives within the literature (Rosa and Dawson, 2006; Carrasco, 2014) in our sample young women spinout founders simultaneously invested in family life and often remained primary carers for their children. They developed various coping strategies to combine caring responsibilities with their spinout companies and many felt that they had more autonomy over their time than they did in full-time academic positions. There was a sense that these younger women, and some younger men, were beginning to challenge the established convention that business comes before everything else.

'For a number of people in the spinout community – from some of the people who are in spinouts, some of the investors, some of the authorities – there is an element that the business comes before everything else. And that other things you might be involved with, your children, your family, you can deal with them later […] That's really off-putting and at first I was too scared to challenge that, and then I was just like you know what? I don't have to do this. I don't have to spend three hours of an entire evening on the phone on a conference call; I would rather put my daughter to bed.' [Woman founder]

In contrast, when older, more senior men founders reflected upon the early days of their spinouts, they reported working extremely long hours leaving them reliant on their partners for childcare and domestic work.

These findings show how the narrative around the needs of the business taking priority over personal lives has rendered family responsibilities invisible. To increase women's participation in spinout leadership it is important to challenge this typically masculine working culture. Not only would this benefit women and men with caring responsibilities, but it would create a more sustainable work-life balance for everyone.

PERCEIVED LEGITIMACY OF ENTREPRENEURIAL ACTIVITIES WITHIN THE ACADEMY

There was a perception that spinouts, and other forms of academic entrepreneurship, were not valued as highly as more traditional forms of research activity. It was felt that commercialising research is not properly recognised in academic promotion criteria and that researchers engaging in these activities run the risk of undermining their careers.

'We did begin to see younger academics developing much more of an awareness of enterprise, because I think the older established academics were very much of the school of thought that in general you're there to research and teach. It's only as the impact agenda has really taken hold, and the general mood towards providing entrepreneurship training and so on, that we did begin to see younger stage academics coming forward, saying "I would like to do this."' [Woman key informant]

Founders received mixed messages from their institutions, with some being offered formal part-time positions to manage their time while others relyied on colleagues and department heads to 'turn a blind eye' to their spinout activity. Of those who maintained full-time academic roles, there appeared to be an expectation that they run the spinout company over and above their academic responsibilities.

'One thing I would say about universities with spinouts is that they don't take into account that you've got to do all your other jobs […] I'm full time with the university, you're just having to squeeze it in where you can.' [Man founder]

Although both the research impact agenda and the Knowledge Exchange Framework have brought spinout companies much more into focus, there seems to be a need for institutional culture change to ensure that commercialisation of research is also considered a legitimate 'intellectual endeavour'.

'There is as much intellectual endeavour in growing the business as there is in doing the science.' [Man founder]

'The challenges that women face are very similar to the challenges that people from ethnic minorities face.'

Man founder

MENTORS AND ROLE MODELS

Founders valued having access to good mentors and many of these were recruited on an informal basis. Informal mentors were praised for offering psychological as well as instrumental support and were often known to the founder or were part of the spinout from the beginning. Formal mentors were usually recruited as part of training initiatives or identified by TTOs. These mentors tended to have significant commercial experience and, as such, were likely to be (older) men. There was some evidence that these relationships could create unequal power dynamics between mentors and mentees, which was enhanced for young women working with men who may have sexist and outdated views about women.

'The mentor that I was assigned was male and I liked him, but he was very old school. He said to me when I went to do the pitch that I should wear my tartiest dress to give the pitch. He was like a different generation, he was much older than me and he treated me like a kind of, like a bit of a silly sort of daughter.' [Woman founder]

Networks were mentioned as a valuable way to find mentors and it was felt that institutions and incubators could do more to create and foster networks aimed specifically at academic founders. This would ensure mentors were more 'relatable', something that was especially important for women founders who were looking for role models or individuals who could better understand their challenges.

'Visibility and making role models more visible for other women can be important. When I go to meetings with investors, if everyone's in their 50s, male, white and wearing a suit, I feel quite alien.' [Woman founder]

MAKING THE SPINOUTS ECOSYSTEM MORE INCLUSIVE

At the end of each interview, founders were asked for their final thoughts on what universities should do to increase women's representation as founders of university spinout companies. Their suggestions included the need for improving perceptions around commercialisation of research across the academy and for proper recognition of these activities in promotion criteria:

'Universities can do a lot by linking it directly to promotions criteria […] I think it will happen naturally now, because of the impact agenda and because of cash […] I think a lot more people would do this if it was better recognised in promotions.' [Woman founder]

Retention of women researchers was also identified as an area where institutions should pay more attention as it was noted that 'at postdoctoral [level] it just falls off a cliff'. The need to promote more science disciplines to girls in schools was also noted. Finally, it was highlighted that STEM is dominated by white men and that universities need to pay more attention to racial inequalities within STEM research:

'I think the challenges that women face are very similar to the challenges that people from ethnic minorities face […] the whole area of spinout companies is very much dominated by white males […] the ethnicity imbalance is worse but it's not talked about as much in statistics. Gender imbalance isn't as bad as ethnicity imbalance within STEM.' [Man founder].

Pathways to Spinout Companies

Our findings show that there can be different pathways to spinning out a company from university research.

The journey often starts with a patent but not in all cases. There might be intermediate steps to commercialisation, such as consultancy and licensing. Public funding, such as grants provided by Innovate UK, can offer a helpful financial springboard at the early stages of the process. From the experiences of women and men founders (both those we directly interviewed and those we have undertaken background research on), we have identified a few examples, outlined below, and highlighted key steps which illustrate such diversity.

PATHWAY 1

From university consultancy to spinout

1 Worked with the university to file a patent.

2 Established a university consultancy which generated an annual turnover of approximately £250K.

3 Having developed an in-house, well-established university consultancy, she began to set up a spinout. Having a ready-made business helped to get the spinout off the ground.

4 Existing staff in the university consultancy business were transferred to the spinout company; an initial small investment was secured from a business angel which was complemented by a revenue stream from royalties and a licence deal.

WOMAN FOUNDER

At the time of spinning out she was a full-time academic in mid-career with young children. She is currently in a full-time university executive role and company director.

ICURe

The ICURe Innovation to Commercialisation programme provides up to £35k of funding from Innovate UK for university researchers at early career stage with commercially-promising ideas to 'get out of the lab' and validate their ideas in the marketplace. After a successful pilot with SETsquared Partnership universities, ICURe has been rolled out across the UK, helping establish over 90 new companies across 60 universities and research establishments. Of those who apply for the scheme, just under a third (31%) of the Early Career Researcher (ECR) Entrepreneurial Leads are women.

Funding is available over three months and provides a salary and travel budget for an ECR. Funding recipients are encouraged to travel and are given a target of holding 100 conversations around the world with potential customers, regulators, suppliers, partners and

£35K

funding provided by Innovate UK for university researchers to validate their ideas.

competitors to assess the commercial viability of their research. To support them, researchers are offered a 3-day intensive training bootcamp alongside bi-monthly contact and coaching sessions. Upon completion of the scheme, participants are expected to have developed a market-ready business model, and teams that have demonstrated the most promising market potential will be invited to apply for further Innovate UK grants to develop the business further.

See **www.setsquared.co.uk/programme/ icure-programme-2** for further information. Data correct as of February 2020.

PATHWAY 2

ICURe funding: a springboard to spinout

1 Awarded funding to join the ICURe programme that provided three months of her salary to explore potential for commercialising the research and building up the business case.

3 Left academia to become the company's full-time CEO.

WOMAN FOUNDER

She is full-time CEO of the company which is now in profit.

2 Pitched for initial investment and founded the company with her former Principal Investigator as co-founder.

PATHWAY 3

Working alongside a part-time CEO with experience of working with academics

1 Worked with the university to file a patent.

3 The team won a grant from Innovate UK that helped to kick-start the spinout. This was set up as a shell company for about a year while pitching to investors for about a year and a half.

WOMAN FOUNDER

She is still a full-time academic spending approximately half of her time in the company.

2 She was introduced by the university to a business person with experience of acting as part-time CEO alongside academics, who worked as a consultant (initially paid through university funding) to develop a business plan.

4 Once the grant and investments were received, she was able to start looking for premises and staff for the new company.

PATHWAY 4

From PhD research to spinout

1 The founder undertook courses and summer schools on the topic of entrepreneurship during her PhD and began exploring alternative career paths. She began to learn more about commercialisation from colleagues who had filed patents and her supervisor.

3 When she finished her PhD, she decided to incorporate the spinout with her co-founders who were two senior academics from her University.

WOMAN FOUNDER

She is full-time with the spinout and is the CEO.

2 Started applying for and participating in pitching and start-up competitions, and gathered prize money.

4 Currently looking for investor offers.

PATHWAY 5

Spinning out from postdoc position

1 Worked as a Postdoctoral Researcher on an interdisciplinary project exploring multiple uses for a specific piece of scientific equipment.

3 Employed the services of a specialist consultancy firm to help with funding proposals, resulting in successfully winning a competitive industry grant.

5 Won Innovate UK grant to set up the company which was match-funded by the university's enterprise fund. A person who was involved in this grant application became the company CEO.

WOMAN FOUNDER

She is full-time with the spinout and is the CTO.

2 She undertook the ICURe programme to explore the market potential.

4 Undertook courses on entrepreneurial and business skills happening throughout the university.

6 Filed for a patent. Looked for further funding and received money from angel investors and research grants. Currently in their second investment round, looking for further funding. Plan to sell the company within five years.

PATHWAY 6

Spinning out from a Master's degree*

1 While studying for an innovation and design focused Master's, she had the initial idea for a product.

2 Applied for an Enterprise Fellowship after being mentored by a senior professor with experience of industry collaboration.

3 Raised seed investment from UK Angels for £350K and £113K social grant funding.

4 Collaborated with public services and manufacturing companies to set up production for the product and undertake testing and clinical feedback.

5 Approached the private sector for distributors and charities who may be interested in the product.

6 Undertook a full commercial launch alongside several trials in progress around the country. Currently exploring new markets.

WOMAN FOUNDER

She is full-time with the spinout and is the CEO.

* This example was created from desk-based research of UK women founder biographies and therefore has been adapted from third party information.

Recommendations

Based on the findings from this research we offer a set of recommendations to Higher Education Institutions (HEIs) and to the Higher Education (HE) sector as a whole, framed within key factors that influence university spinout performance as identified by Coates (2019) and based on the work of Hayter et al. (2018).

We hope that this approach will help institutions to harness in full the talent of both men and women researchers at different stages of their career and enhance spinout performance, as well as stimulating the development of gender-inclusive academic entrepreneurship.

HUMAN CAPITAL

Support the development of networks of '**relatable mentors**'. Helping women researchers in the process of spinning out – or considering commercialising their research – to **connect with other women who have gone through a similar experience**, either within or outside academia. Entrepreneurial alumni can provide a pool of 'relatable mentors' from the wider business community.

HEIs should facilitate the development of more diverse and gender-balanced spinout teams. TTOs should be encouraged to **foster more diverse networks of expertise** and seek out diverse talent to extend existing pools of advisers and potential board members.

Enhance visibility of women founders as role models, including women from diverse backgrounds who have successfully spun out across different career paths and at different stages of their careers.

ENTREPRENEURIAL ENVIRONMENT

HEIs should take steps to promote a gender-inclusive entrepreneurial environment by: monitoring activities linked to commercialisation of research and innovation, such as consultancies, patent applications and spinout by gender and other equality-related characteristics; giving **greater visibility to diverse role models**. They should also consider how inclusive academic entrepreneurship is promoted across different academic departments.

HEIs should take a lead and work with key stakeholders within local innovation ecosystems to ensure that they **become more gender inclusive**. Institutional and external ecosystems that are highly male dominated, such as investment, can reinforce each other through lack of diversity.

SOCIAL NETWORKS

It is important to provide greater opportunities for researchers, and especially ECRs, to interact with businesses through the development of networks. Draw on entrepreneurial alumni to facilitate connection with businesses and industry.

FINANCIAL RESOURCES

HEIs should clearly communicate **different sources of financial support** for academic entrepreneurial activities and spinouts.

HEIs should work with the investment community to **set up specific funding opportunities** aimed at women researchers who wish to set up a spinout company.

ACADEMIC ENTREPRENEURSHIP PROGRAMMES

HEIs should offer **academic entrepreneurship programmes that are gender sensitive** and recognise intersecting inequalities. Women founders have mixed views about women-only programmes, as they are concerned that these are about 'fixing the women' rather than tackling structural barriers. Whatever approach institutions intend to take, it is important that academic entrepreneurship programmes are gender sensitive (e.g. use of diverse images, examples, role models etc.) and are integrated in early- and mid-career development initiatives.

Ensure that the role of Technology Transfer Offices (TTOs) is clearly communicated and features in entrepreneurship programmes. Provide TTOs with equality training, set in the context of academic entrepreneurship and of establishing a spinout company, to explore equality issues within the innovation ecosystem. Be vigilant against bias.

UNIVERSITY MANAGEMENT AND POLICIES

HEIs should review their processes and structures on research commercialisation to ensure that **all individuals have equal opportunities** in accessing and getting support for their ideas, irrespective of age, gender, ethnic identity and other individual characteristics.

HEIs should reflect on the flexibility of available career pathways and provide space and opportunities to accommodate **inclusive and alternative career routes**, including academic entrepreneurship and spinout leadership. They should also consider how academic entrepreneurship and the establishment of spinout companies are properly recognised, valued and rewarded in the academic promotion process.

Commercialisation of research and spinout-related activities should be recognised through appropriate time allocation within an academic work-load. Institutional policies and practices should be developed to allow researchers to **balance an academic career with commercialisation of research** and spinout leadership (e.g. sabbaticals, fellowships at critical times to explore business viability) along with personal life.

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For further information

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