

Boosting returns
Lessons learned from a
University Challenge Fund



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Foreword

University Challenge Funds were intended to be evergreen, with returns made from investments ploughed back to fund further growth. However, investment restrictions imposed on the funds have made self sustainability difficult to attain...



University Challenge Funds were established in 1999 with the objective of fostering a spirit of entrepreneurship and providing universities with access to seed funds to take projects from the lab bench out into the commercial world. UCFs were intended to be evergreen, with returns made from investments ploughed back to fund further growth. However, whilst many of the objectives of the UCFs have been achieved, investment restrictions imposed on the funds have made self sustainability difficult to attain.

In December 2009, The Department for Business, Innovation and Skills conducted an independent review into the government's venture capital funds, including UCFs, and reported a number of factors which tend to improve the chances of success, including larger fund sizes and the ability to make follow on investments. Their report also noted that investment limits applied to the funds restricted the pool of viable business propositions that could be targeted and the size of initial and follow on investments.¹

Against this backdrop, we were invited by the Wyvern Seed Fund to analyse the performance of their fund and to model a range of potential investment strategies to assess the potential for boosting returns. The Fund, run by the universities of Bristol, Southampton and, until recently, Bath, has been one of the more successful UCFs. However, like other UCFs, the Fund's ability to follow its investments has been restricted by funding caps.

We are grateful to the Fund for allowing us unparalleled access to the financial information relating to its investments held since its inception in 1999. Using this information, we have undertaken a comprehensive analysis of real investment data in order to consider three of the most important questions faced by the Fund:

1. If more funds had been available to invest, and the investment cap had been removed, could returns have been greater?
2. What size of fund would have been required to achieve such returns?
3. What has been the effect on returns of liquidation preferences?

The answers to these questions in respect of the Wyvern Seed Fund allow important lessons to be drawn on how UCFs more widely may have the potential significantly to boost returns.

Richard Vellacott
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¹ The Department for Business, Innovation and Skills "Venture capital support to small businesses" National Audit Office, 10 December 2009

Background and scope of project

About University Challenge Funds

University Challenge Funds were created to provide universities with access to seed funds that assisted the commercialisation of research. The contributors were charities, such as the Wellcome Trust and Gatsby Charitable Foundation, and HM Government, with 25% of each university fund being provided from its own resources. £45m was allocated in the first round of the competition in 1999, with 15 seed funds being established. A further £15m was allocated in October 2001, which provided for an additional 4 seed funds and 1 extension to a previous fund. 57 institutions had access to UC seed funding. Although no further rounds of ring fenced university challenge funding are planned, in recognition of the importance of the university challenge concept, seed funding is now one of the strands of the core Higher Education Innovation Fund programme.

Since its inception, the objective of the Fund has been to create a virtuous circle by investing in a balanced portfolio capable of delivering sustainable cash flows.

About the Fund

The Wyvern Seed Fund, formerly known as The Sulis Seedcorn Fund, operated as the University Challenge Fund of the Universities of Bath, Bristol and Southampton from 1999 to 2008. In August 2008, the Sulis Seedcorn Fund was divided into two parts: the Wyvern Seed Fund and a separate fund managed by the University of Bath. Between 1999 and 2007, the Wyvern Seed Fund was managed by Quester Capital Management, and is now managed by Wyvern Asset Management Limited, a joint venture between the Universities of Bristol and Southampton. The Fund offers a source of finance to the academic communities of those universities.

For the purposes of our analysis, all University of Bath shareholdings have been considered together with those held by the Wyvern Seed Fund. The two funds together are referred to in this analysis as "the Fund".

Since its inception, the overall objective of the Fund has been to invest in a balanced portfolio of newly established spin-out companies. Technologies with commercial potential have been selected by the Fund from a number of academic projects generated within the research departments of the universities. Of the original £9m fund raised in 1999, over two thirds had been invested by 31 July 2009 in 28 early stage technology companies, predominantly in the form of equity and convertible debt.

The aim of the Fund is to establish sustainable cash flows using returns generated from the realisation of investments, such as the IPO of Offshore Hydrocarbon Mapping plc in 2004, to replenish the Fund.

The investment cap

The companies invested in by the Fund typically demonstrate the classic profile of development stage technology businesses: a need for early stage risk capital and then a requirement for a series of subsequent investment rounds in order to fund further development until such time that the company becomes self financing. The period from incorporation to self sustainability usually takes a number of years and later investment rounds, particularly if participated in by venture capital funds, typically include preferential rights.

The Fund was established to invest at the seed stage. Under the Rules of the Fund, the maximum investment in any one project has been restricted to £250k. As a consequence, the Fund has not been permitted to follow its investments through subsequent funding rounds. Accordingly, the Fund has suffered dilution of its shareholdings and has been pushed down the "preference stack" such that the shareholders investing at a later stage are entitled to any returns in priority to shareholders, such as the Fund, not participating in that round.

Analysis of the Fund

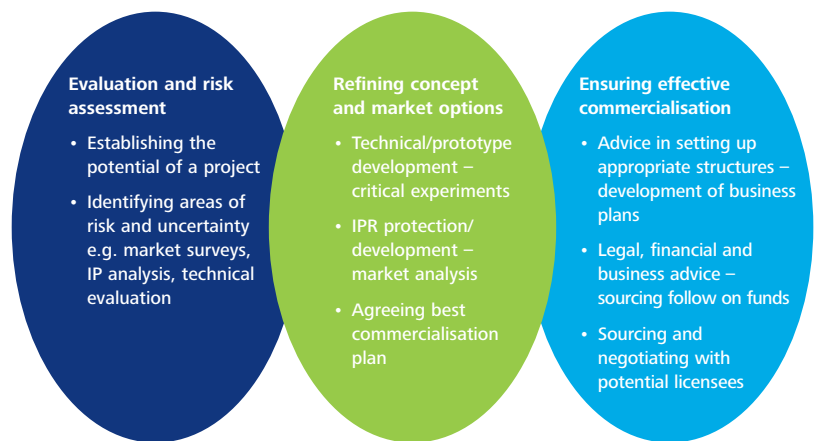
The objective of our analysis was to use actual historic data provided by the Fund since its inception in 1999 and apply certain hypothetical funding scenarios in order to evaluate the potential fund performance without the constraint of a £250k investment cap.

Specifically, our analysis was designed to consider the following three questions:

1. If more funds had been available to invest, and the investment cap had been removed, could returns have been greater?
2. What size of fund would have been required to achieve such returns?
3. What has been the effect on returns of liquidation preferences?

About the Fund

The Fund was established to fill the gap between research funding and commercial Venture Capital by providing seed stage investment capital. Funds are typically used in the following areas:



Methodology

In order to complete the analysis, we applied the following methodology.

Construction of capitalisation tables

Capitalisation tables were prepared for each investee company showing the actual historic equity structure as at the date of each investment round, using management information, financial statements, annual returns, investment agreements and articles of association as source documents.

Hypothetical investment scenarios

A series of capitalisation tables was modelled for each investee company in order to apply four hypothetical follow on investment scenarios.

• Scenario 1: invest pro rata to the original investment percentage

In this scenario, it was assumed that the Fund continued to invest in each subsequent fundraising round at a level proportionate to the Fund's share of the original seed investment round. For example, if the Fund had invested in 10% of the seed round, it would continue to invest 10% of subsequent rounds, with entitlement to the same preferential rights as other investors.

• Scenario 2: invest to maintain diluted percentage

Under Scenario 2, the model assumed that the Fund would continue to invest sufficient funds to maintain its original diluted shareholding following seed funding. For example, if the Fund held 10% of the total diluted share capital at the seed stage (taking into account all equity, share options and convertible debt), it would continue to invest sufficient funds in subsequent rounds to maintain this total diluted shareholding.

• Scenario 3: invest on a tapering basis of 50%, 25% and 10%

The tapering basis assumed that, after its initial first round seed investment, the Fund would invest 50% of the funds raised in any second round investment, 25% of any third round and 10% of any subsequent rounds. For example, if the total investment in round 3 was £1m, it was assumed that the Fund would invest £250k.

• Scenario 4: active fund management

Under this scenario, the hypothetical level of investment in each round was determined through a series of interviews with the Fund Manager, Andy Allars, in order to determine the level that, absent any investment cap, the Fund would have wanted to invest in each round, using only information that was available at the time.

Funding rounds were taken to occur when any significant third party funds were raised by the company, for example through equity rounds, the issue of convertible debt or the issue of deep discounted bonds. In each case, the level of investment by third parties in each round was adjusted in order to maintain the total funds invested in each round at actual historic levels.

Determination of the valuation at 31 July 2009

The valuation of private companies at the development stage is inherently judgemental and complex. In order to establish a broad picture of the value of each company, three valuation scenarios were applied. Each valuation was determined as at 31 July 2009, being the last financial year end of the Fund for which data was available for the purposes of this analysis. In each instance, the valuation of the investee company as a whole was determined and then that of the Fund's shareholding, taking into account dilution and preferential rights held by each investor as appropriate.

• Valuation A: valuation based on share price at last funding round

This valuation scenario assumed that all equity was valued as at the share price of the last fundraising round, less any impairment, in accordance with guidelines issued by the British Venture Capital Association.

The valuation of the Fund's shareholding was then calculated on a diluted basis assuming the exercise of warrants, conversion of debt and exercise of all share options where this would have been advantageous to the holder at the time.

Finally, the value attributable to the Fund's shareholding was then determined taking full account of preferential rights held by each shareholder.

- **Valuation B: estimated actual valuation at 31 July 2009**

Valuation A did not take account of any increases in value since the last funding round. Accordingly, a second valuation scenario was modelled to consider subsequent changes in the valuation of each company. Valuations were determined through inspection of documentary evidence and interviews with the Fund Manager. In each case, and to the full extent possible, the valuation was determined using information available at the time.

The valuation of the Fund’s shareholding was then determined taking into account dilution and preferential rights as above.

- **Valuation C: as Valuation A but with no preference rights**

This scenario followed the valuation methodology applied under Valuation A but assumed that no investment rounds included preferential rights, each round involving only the issue of ordinary shares.

Consolidation of investment scenarios and analysis of results

For each of the four investment scenarios and three valuations that were modelled, the corresponding cash flows for the Fund were determined on a consolidated monthly basis.

Fund performance and return on investments may be measured in a number of ways. For the purposes of this analysis, in each case, investment returns were measured in terms of the net value of the investments held (having deducted the original cost of investment), the Internal Rate of Return (“IRR”) on an annualised basis and investment multiples.

Key assumptions and judgements

Judgements

Whilst every effort was made to apply the facts that were known at the time, Scenario 4 (active fund management) and Valuation B (estimated actual valuation) are inherently judgemental.

Exits

The valuation of each company has been determined at a fixed point in time which may not be representative of the company’s true value. In reality, the Fund would seek to time its exit from investments in order to maximise their potential value. Additionally, the Fund’s ability to exit such investments at a desirable valuation depends upon the availability of appropriate routes to realisation, such as a receptive IPO market and/or a positive environment for mergers and acquisitions.

Definitions used in this analysis

Annual IRR	The Internal Rate of Return of the investments on an annualised percentage basis
Exit	Sale or IPO of the portfolio company generating proceeds for reinvestment by the Fund
Multiple	The ratio of proceeds received from exit from the investment to the size of the original investment
Net value	The total value of investments held by the Fund net of the original investment

Presentation and analysis of results

Actual fund performance

Table 1 shows an analysis of the actual performance of the Fund, having invested a maximum of £250k at seed stage in accordance with the Rules of the Fund. As at 31 July 2009, the total cash invested by the Fund in portfolio companies was £6.4m, and £2.6m had been realised in cash through exit events.

The valuation of the remaining investment portfolio at that date, based on last round prices under Valuation A, was £10.1m. Accordingly, the calculated net value, having taken into account the original cost of investments, was £6.3m. This represents an annual IRR of 20.7% at an investment multiple of 1.98. In effect, from its inception to 31 July 2009, the Fund had, on paper, received its money back from investments twice over, representing an annual interest rate of just over 20%.

Updating the valuation to take account of events between the last funding round and 31 July 2009 in accordance with Valuation B gave a portfolio valuation of £12.0m, an increase of £1.9m over that under Valuation A. Accordingly, the calculated net value of investments held by the Fund was greater than that under Valuation A at £8.2m, representing an annual IRR of 24.4% and multiple of 2.28.

If more funds had been available to invest, and the investment cap had been removed, could returns have been greater?

Table 2 sets out each of the hypothetical investment scenarios as previously described for each of Valuation A and Valuation B.

In each instance, the hypothetical investment scenario would have generated a greater net value than was actually the case. Therefore, based on this model, it is clear that removal of the investment cap, giving the Fund the ability to follow its investments, did have the potential to generate greater value for the Fund.

The picture is less clear with respect to other measures of fund performance. For instance, each scenario resulted in a reduced multiple than was actually achieved, primarily because of the increased cash required to follow investments through to later rounds. Annual IRRs also suffered under strategies that would have committed significant funds across the whole investment portfolio, such as scenarios 2 and 3, rather than on a company-by-company basis.

Table 1. Actual performance of the Fund as at 31 July 2009

	Valuation A – Last round valuation				Valuation B – Updated valuation		
	Total cash invested £m	Net cash flow £m	Annual IRR %	Multiple	Net cash flow £m	Annual IRR %	Multiple
Actual	6.4	6.3	20.7%	1.98	8.2	24.4%	2.28

Table 2. Hypothetical performance of the Fund as at 31 July 2009 (Valuation A and Valuation B)

	Total cash invested £m	Valuation A – Last round valuation			Valuation B – Updated valuation		
		Net value £m	Annual IRR %	Multiple	Net value £m	Annual IRR %	Multiple
Actual	6.4	6.3	20.7%	1.98	8.2	24.4%	2.28
Scenario 1 – % Original investment	27.1	13.7	22.9%	1.50	18.5	28.4%	1.68
Scenario 2 – Maintain diluted %	18.9	9.9	17.7%	1.52	13.3	22.1%	1.71
Scenario 3 – Tapering %	35.7	14.1	17.0%	1.39	24.8	26.3%	1.69
Scenario 4 – Active fund management	21.9	12.9	24.8%	1.59	20.8	33.7%	1.95

By contrast, it can be seen that scenario 4, active fund management, had the greatest potential to generate significant increases in the net value of the Fund, to £12.9m and £20.8m under Valuations A and B respectively. This scenario also would have provided the strongest returns when measured in terms of annual IRR, and the best of the hypothetical scenarios in terms of investment multiple.

Therefore, we can conclude that it would have been possible to generate substantially greater returns in the absence of the investment cap provided an appropriate follow on investment strategy had been applied.

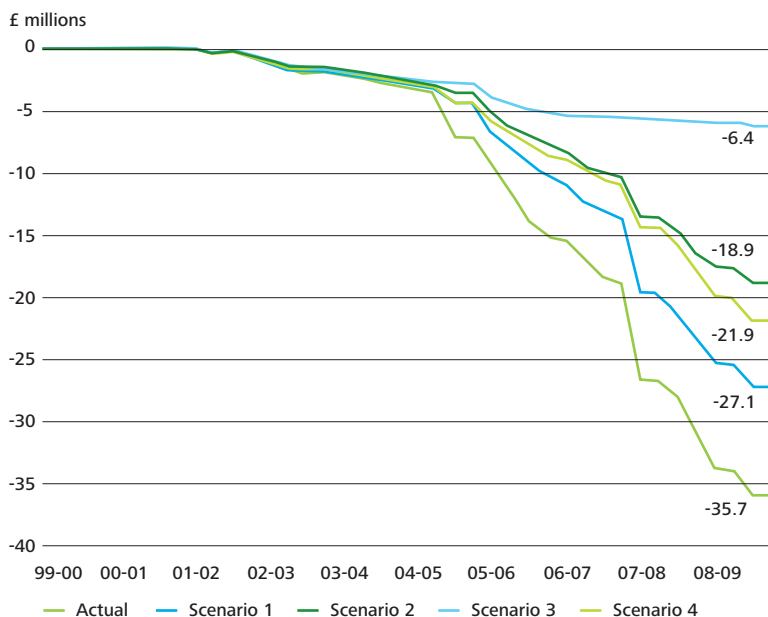
What size of fund would have been required to achieve such returns?

Figure 1 shows the cash flow requirement under each of the scenarios as at 31 July 2009.

It is evident that each of the hypothetical follow on investment scenarios would have imposed significant cash demands on the Fund over and above those actually invested. Scenario 2, under which the original diluted shareholding was maintained, would have been the least cash intensive of the scenarios, yet still would have required £19m. The most demanding of cash resources would have been Scenario 3, the tapering investment scenario, which would have required cash of £36m to be invested. This is the case primarily because the Fund would have been required to invest in significant percentages of later rounds which are typically of a relatively large size.

The best balance between the funds required to be invested versus returns generated was Scenario 4, active fund management. This scenario would have required investments totalling £22m from the inception of the Fund through to 31 July 2009.

Figure 1. Cash flow requirement under each investment scenario



Using Scenario 4 as a base point, we can estimate the total fund size required to have pursued the follow on strategy to 31 July 2009. Taking into account the estimated overhead costs of the Fund over the period of £4m and, assuming a reasonable level of headroom at £2.5m, the required fund size would have been as follows:

£22.0m Funding requirement Scenario 4	+	£4.0m Fund overhead costs	+	£2.5m Headroom	=	£28.5m
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The estimated fund size of £28.5m would have been just over three times the size of the original fund of £9m.

It is important to note that these cash flows only represent the cash requirement up to 31 July 2009 and do not represent the total cash requirement over the life of the Fund. This is because continuing to invest funds in further funding rounds beyond 31 July 2009 would also require further funds. Assessment of the lifetime funding requirement falls beyond the scope of this report but would represent a valuable piece of further analysis.

What has been the effect on potential returns of the liquidation preferences?

Table 3 compares Valuation A with Valuation C, which modelled the removal of preferential rights accruing to shareholders investing in follow on investment rounds.

Examining actual fund performance, it can be seen that removal of liquidation preferences would have improved all measures of actual returns. This improvement would have arisen because, having only invested at the seed stage, the Fund would not have subsequently been pushed down the preference stack by investors in later rounds.

Conversely, comparison of each of the hypothetical follow on investment scenarios shows that Fund performance under Valuation C would have suffered in comparison with Valuation A. Under Valuation C, the Fund would not have benefited from the preferential rights that would otherwise have arisen from its strategy of participation in later rounds.

Table 3. Hypothetical performance of the Fund as at 31 July 2009 after removal of preferential rights

	Total cash invested £m	Valuation A – Last round valuation			Valuation C – No preferences		
		Net value £m	Annual IRR %	Multiple	Net value £m	Annual IRR %	Multiple
Actual	6.4	6.3	20.7%	1.98	6.9	21.9%	2.08
Scenario 1 – % Original investment	27.1	13.7	22.9%	1.50	12.4	21.3%	1.46
Scenario 2 – Maintain diluted %	18.9	9.9	17.7%	1.52	9.4	17.0%	1.49
Scenario 3 – Tapering %	35.7	14.1	17.0%	1.39	11.6	14.5%	1.33
Scenario 4 – Active fund management	21.9	12.9	24.8%	1.59	11.6	23.0%	1.53

In conclusion

We are grateful to the Wyvern Seed Fund for providing the unprecedented access to management information that allowed us to prepare this analysis.

Our analysis started with three questions of major significance to the Fund: would removal of investment caps have had the potential to increase returns, what size of fund would have been required to adequately follow seed investments through later rounds and how did preferential rights impact the returns generated by the Fund?

Analysis of actual performance of the Fund demonstrated that it has, on paper, been successful in its investment strategy, generating significant potential value at good multiples and an annual IRR in excess of 20%. However, this success on paper should be tempered with the recognition that success only comes on crystallisation of these notional gains into cash. Only then can it be determined whether the Fund can be considered to be evergreen. Timely exit from its investments at appropriate valuations remains a significant challenge for the Fund, particularly under current market conditions.

It is evident from our analysis that, working without the constraints of the £250k investment cap, and given license to follow its early stage investments through subsequent funding rounds, the Fund would have had the potential to have generated even greater returns for reinvestment into further portfolio companies.²

Selection of an appropriate investment strategy is crucial to generating the returns required for the Fund to be self sustaining. An active fund management strategy, whereby experienced fund managers select the appropriate investment strategy on a company-by-company basis, has the potential to provide a balance between the size of fund required and the ability to boost returns.

In order to prosecute such a follow on investment strategy, a significantly larger fund would have been required, in the region of £30m rather than the original fund size of £9m, with further funds required to continue to follow existing investments beyond 31 July 2009. Whilst such a strategy clearly puts more funds at risk and relies significantly on the investment expertise of the fund managers, the potential for returns would have been greater.

It is evident that, having been restricted to seed investment, actual fund performance was adversely impacted by the preferential rights accruing to other investors in later fundraising rounds. Our analysis demonstrated that, had the Fund been able to follow its investments through later rounds, the Fund would have benefited from equal entitlement to preferential rights and this had the potential to enhance returns yet further.

Further analysis of the funding requirements over the entire life of the Fund would be a valuable next step in considering the appropriate investment strategy for University Challenge Funds if they are to achieve their original aim of becoming evergreen sources of finance for university projects to become the success stories of the commercial world.

² Investment caps for UCFs were increased to £500k last year, however most UCFs had already invested the majority of their funds

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Acknowledgements

We are grateful to the Wyvern Seed Fund for commissioning this research and, in particular, to Andy Allars and Rona Wagstaffe for their valuable input and help in providing the data that made our analysis possible. We are also grateful for the co-operation of the University of Bristol and the University of Southampton.

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Notes

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Designed and produced by The Creative Studio at Deloitte, London. 6377A

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