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Establishing a New UK Finance Escalator for Innovative SMEs: The Roles of the Enterprise Capital Funds and Angel Co-investment Fund

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Abstract

This paper examines UK public policy addressing the seed and early stage equity finance gap since the Global Financial Crisis (GFC). Drawing on lessons learned from recent studies of UK and international government equity schemes, two contemporary models of government backed equity finance are examined. The focus is on the Enterprise Capital Funds (ECFs) and the Angel Co-investment Fund (ACF), the UK government's main schemes operating in the sub-£2m equity finance gap to address the capital requirements for developing the UK's young, potential high growth businesses.

The paper highlights the shortcomings of traditional interim fund performance analysis and presents current demand and supply side evidence that establishes that these schemes are making attributable impacts on their portfolio businesses and the wider UK economy. It also demonstrates that they are playing important roles in the establishment of a new post GFC UK finance escalator. However, whilst these schemes were found to be currently complementary and effective, their future roles within the UK's evolving post GFC seed and early stage equity markets are also considered.

Key Words: Government Equity Schemes, Venture Capital, Potential High Growth SMEs

Introduction

This paper examines the current roles of the Enterprise Capital Funds (ECFs) and Angel Co-investment Fund (ACF). These are arguably the UK government's leading venture capital (VC) schemes addressing the financing gap at below £2m where young, innovative small and medium-sized enterprises (SMEs) are unable to raise seed and early stage funding from banks or private investors.

Since the discovery of the Macmillan finance gap (1931), the rationale for UK government intervention has long been established. A series of government reviews from Bolton (1971) to Breedon (2012), and a recent Finance White Paper (Fraser, Bhaumik and Wright, 2013) have highlighted the extent of the finance gap (1) and the need to address the equity financing needs of viable young, innovative and potentially high growth SMEs. During the 2000s the UK's equity finance gap was estimated at between £250,000 and £2m (Deakins and Freel, 2012), with the European Union (EU) imposing a state aid ceiling at £2m for initial individual company investments in the UK. However, various reports since Rowlands (2009) have suggested that the UK's equity gap has been rising to at least £5m (North, Baldock and Ullah, 2013; BIS 2012; SQW, 2009). Furthermore, Nesta's (2009) finding that a 'vital 6%' of UK businesses generate over half of all employment has also stimulated UK government policy to assist the financing of the potential high growth businesses that could provide the powerhouse for future, more diverse, rebalanced economic growth.

The more successful VC markets globally have been stimulated by government support (Lerner, Moore and Shepherd, 2005; Murray, 2007; Lerner, 2009, 2010), utilising a range of measures to develop the VC ecosystem. These primarily focus on developing government hybrid VC funds (HVCFs), where core government funding is used to lever private co-investment, which is the focus of this paper. They also require appropriate support service development (Lerner, 2010), new firm pipeline development and investment readiness (Mason and Brown, 2013), and holistic institutional frameworks (Hughes, 2009). In the UK the turbulent last 15 years, which have included the 'Dotcom Crisis' and more recent 'Global

Financial Crisis' (GFC) from 2007, have witnessed an unprecedented increase in the role for government HVCF schemes (Murray, 2007; Mason and Pierrakis, 2013) focusing on stimulating the seed and early stage equity investment markets.

Established in 2006, the £440m Enterprise Capital Funds (ECFs) represent the UK government's flagship seed and early stage VC scheme. Their premier position was underlined by the Chancellor's 2014 Autumn Statement (2) announcing an additional £400m for the scheme. The ECFs operate alongside other specialist HVCFs, notably the national UK Innovation Investment Fund (UKIIF) addressing innovative sectors, and European Union (EU) funded regional funds (3) (BIS, 2013a and 2012a). Post GFC the UK government has supplemented HVCF policy with enhanced tax relief measures (4) encouraging private high net worth individual (HNWI) investment into formal equity through Venture Capital Trusts (VCTs) and informal business angel investments to tackle the equity gap. Additionally, the £100m Angel Co-investment Fund (ACF), introduced in 2011, targets the seed and early stage equity gap through the vehicle of business angel syndication investments.

With the establishment of the British Business Bank in 2013, which is tasked with managing the delivery of a more coherent public-private business finance offer (Van der Schans, 2014), and establishing an improved finance escalator for potential high growth firms, this paper provides a timely examination of the current roles of the ECF and ACF, the two main UK government schemes currently addressing the sub-£2m equity gap.

Content and research questions

The paper proceeds by examining finance gap theories which explain why young innovative, potential high growth firms, experience difficulties in accessing finance. The finance escalator model is adopted to demonstrate how early stage finance should flow and how breakages in this escalator might require remedial government action to repair the model. In addressing these finance gap breakages, government VC schemes may be seen as a major policy tool and key theories relating to their implementation and improvement are presented.

It is acknowledged that government VC schemes cannot be viewed in isolation (Wilson and Silva, 2012) and necessarily relate to a wider set of complementary policies, including to improve access to other types of finance (through grants and bank finance guarantees), encourage private investment (through tax breaks) and develop the finance ecosystem through business support mechanisms (investment readiness programmes), government supply chains (notably through military R&D, Avnimelech and Teubel, 2006), improved quality of financial intermediaries (accountants and legal teams) and a strong and stable exit market (Hwang and Horowitz, 2012; Lerner, 2011).

However, here the focus is on the operation of UK government seed and early stage VC schemes. Previous studies of these schemes have been rooted in pre GFC data, enabling assessment of fund performance, notably in terms of numbers of exits (Munari and Toschi, 2014; BVCA, 2013; Technopolis, 2011). However, they struggle to reflect the true value and impact of these schemes, particularly in seed and early stage VC (Wilson and Silva, 2012) due to a reliance on quantitative and secondary data and the problems of assessing 'dark side' issues. This inevitably means that the full value of exits in terms of return to the fund and the wider UK economy are unknown, along with spillover effects such as secondary employment via contractors and new start-ups or spin-outs from both positive and less successful fund exits (including closures). Furthermore, little attention has been paid to whether the funds are adding economic value by contributing to the improved flow of the early stage funding escalator (North, Baldock and Ullah, 2013).

Here, the focus is on presenting contemporary scheme data in order to provide insight into whether they are meeting an equity gap and making a difference to their assisted portfolio funded companies. This evidence can also assist scheme improvement and effectiveness in terms of their contribution to the evolving post GFC UK finance escalator. A detailed methodology outlines the study's extensive mixed methods, demand and supply-side approach. The paper then contextualises the ECF and ACF schemes in terms of their funding

scale, aims and implementation before proceeding to the survey findings which address the following three research questions:

1. Are the schemes meeting a finance gap? This is examined in terms of scheme demand, portfolio company profile, and evidence of investment duplication and additionality.
2. Are the scheme models suitable? This addresses whether the schemes are sufficiently large, flexible and focused to meet the ongoing financing needs of the UK market and assessed in terms of impacts on portfolio companies and potential fund performance.
3. How do the schemes fit into the evolving post GFC UK finance escalator? Here the schemes' roles are assessed within the UK's current equity finance ecosystem and consideration is given to their potential future evolution in addressing equity financing needs.

Theories of finance gaps

The SME finance market is imperfect (Modigliani and Miller, 1958) with information asymmetries considered the main cause of market failure finance gaps (Akerlof, 1970; Myers and Majluf, 1984) due to the unequal knowledge exchange between the finance provider and the business applicant. This is particularly problematic for young innovative businesses without track records to demonstrate their market traction and value, and often lacking sufficient collateral with their true value being associated with intangible intellectual property (IP). These businesses require risk equity finance, but face problems of adverse selection and moral hazard (Carpenter and Peterson, 2002) resulting from the prohibitively high cost of due diligence for relatively small-scale seed and early stage investments and reflected in the resultant poor performance of these equity markets in recent years (Mason, Jones and Wells, 2010; BVCA, 2013).

The Early Stage Finance Escalator

Berger and Udell (1998) present a conceptual framework of declining information opacity of young firms as they progress through early stage financing. This underpins the finance escalator model (Nesta, 2009a), suggesting that different forms of finance, including grant, equity and debt, are suited to young businesses as they become more established, gain market traction and are better understood by financiers. This stages model will vary according to national and local circumstances relating to the supply of different types of funding over time and also upon the nature of the young viable business. For example, North, Baldock and Ullah (2013) found that soft-start businesses, including corporate spin outs, with well established trading records could access bank finance sooner than start-ups without trading records. Myers (1984) found that entrepreneurs have pecking order preferences, generally preferring debt over equity where external finance is required, whilst Norton (1991, p.287) gives primacy to the role of '*finance officers*' preferences, which is important if a choice of finance exists.

In the UK, the current early stage finance escalator (Harrison, 2013; Gill, 2014) suggests that innovative SMEs at the seed stage will be reliant on founders, friends and family ('3 Fs') for initial funding for R&D and, without a sales track record of at least two years, will be unlikely to raise debt finance from banks. Therefore, additional external funding requirements will need to come from seed grants, such as from Innovate UK, or from equity investors such as HNWIs (individual business angels), seed VCs and crowd equity funders. As these SMEs progress through their early stage development, but are still in pre or early trading, they may require further external funding for pilot products and market development. Again, this will most likely require risk equity funding, typically in the form of business angel syndication which can collectively generate larger sums of investment, or from VCs. North, Baldock and Ullah (2013) in their study of UK technology based small firms (TBSFs) found that a higher proportion of early stage TBSFs established for less than five years required equity finance than their more mature counterparts, with earlier stage TBSFs favouring angel finance and later stage favouring VC. Once these businesses achieve market traction and pass beyond two years of trading, they become eligible for bank debt finance (GLA, 2013) and may select this if they wish to retain or buy back equity share. Alternatively, they may progress to later stage private VC, access the UK government's Business Growth Fund, or undertake an early trade sale exit.

UK Finance Escalator breakages and funding gaps

The past decade in the UK reveals that, even before the GFC, the smooth delivery of the UK finance escalator for early stage innovative SMEs envisaged in the Innovation Nation White Paper (2008) was failing. Primarily, failures of early stage private sector VCs in the UK led to their retreat to less risky later stage investments at above £2m. This resulted in an increasing requirement for public HVCFs to fill this void (Murray, 2007; Mason and Brown, 2013; Mason and Pierrakis, 2013). Rowlands (2009) also found evidence of a UK equity gap for more capital intensive R&D at upwards of £10m. These findings present clear signs that the finance escalator was already sub-optimal. Add to this the onset of the GFC and the resultant squeeze on finance through bank credit rationing (Cowling, Liu and Ledger, 2012) and a more

cautious approach by investors (North, Baldock and Ullah, 2013) resulting in blockages in the seed and early stage investment exit markets for business angel investors at below £250,000 (Johnson, 2009) and it is clear to see how an already under pressure early stage finance escalator had become broken and fragmented (Mason, Jones and Wells, 2010; Gill, 2010; North, Baldock and Ullah, 2013). Whilst recent Nesta (2014) evidence suggests that in the post GFC period UK intangible asset investment has recovered, tangible asset investment has remained flat (5). This evidence suggests that more recent investment has been drawn to low cost, faster return digitech investments, rather than more expensive longer term Rowlands type capital investments (GLA, 2013).

Market failure or 'thin markets'?

There would appear to be a strong justification for public policy intervention in order to address these funding gaps, particularly if they provided evidence of market failure. Here it should be noted that in policy terms there is an important distinction between thin markets (Nesta, 2010) and a lack of a sufficient pipeline of investible young innovative SMEs (Mason and Brown, 2013) as opposed to the inability of viable business propositions to obtain sufficient funding. The former has led Murray (2007) and Mason and Harrison (2001) to question the existence of a funding gap, if there is insufficient or poor quality demand, whilst the latter would suggest the existence of market failure (North, Baldock and Ekanem, 2010; Van der Schans, 2014). A recent GLA (2013) report on SME finance in London found that there was a clear outstripping of demand for finance by young innovative businesses, despite the considerable increase in equity finance being made available in the London region from accelerators (often corporate backed), the rise of business angel syndication and networks, angel capital groups and seed VCs. However, the report poured caution over the quality of investments and posed the threat of a digitech bubble burst.

Developing a coherent equity finance ecosystem and Finance Escalator

The latter point is indicative of the need for policy interventions requiring careful consideration of potential pitfalls (Murray and Lingelbach, 2009; Lerner, 2010) which may result from agency failures (Akerlof, 1976) from poor management and policy making. From a policy perspective, there is the need to balance economic development requirements such as regional imbalances (Mason and Pierrakis, 2013) and financing more marginal but viable business cases (Oakey, 2003) with the provision of a private market-led approach which optimises returns (Lerner, 2010). There is also the need to avoid programme duplication and private sector displacement (Leleux and Surlemont, 2003) and the attendant negative impacts that over supply can have on inflated valuations and reduced quality of deals as investors struggle to find justifiable investments (Lerner, 2010; NAO, 2009).

The focus of this paper is on the supply-side finance escalator, but it is acknowledged that this cannot successfully develop in isolation from the wider equity finance ecosystem (Hwang and Horowitz, 2012). The development of a more efficient seed and early stage financing escalator or pipeline (Mason and Pierrakis, 2013; Mason and Brown, 2013) requires a carefully integrated policy to develop the VC and equity finance ecosystem in the UK (Hughes, 2009), taking into account both the supply-side mechanism and potential demand-side failures such as investment readiness (Mason and Kwok, 2010) and the crucial roles of the financial intermediary advisory and support network (Lerner, 2010).

The role of government VC in addressing finance gaps

Lerner (2005, 2009, 2010, 2011) has drawn attention to government activities in catalysing and underpinning the world's most successful VC markets, including the Yozma funds in Israel and the Small Business Investment Company (SBIC) in the US. He concurs with Hughes (2009) that it is essential for government to lead in establishing a financial ecosystem and generating sufficient critical mass and scale of VC activity, support services (such as specialist accountants and legal services) and financial networks to facilitate a private sector led solution to the equity gap. To this effect various observers (e.g. Murray 2007; NAO, 2009; Lerner 2010, 2011; Pierrakis, 2010; Technopolis, 2011; Mulcahy, 2013) have outline their guiding principles for successful HVCFs, based upon global lessons. These are briefly summarised below.

Sufficient size and scale of VC activity

There is a need for sufficient size and scale of VC activity. UK and European VC funds have been dwarfed by their US counterparts; Deakins and Freel (2012) indicate that US funds distribute over five times the value from less than four times the number of funds (Ernst & Young, 2010). The implication is that UK VC funds do not have sufficient scale to achieve Markowitz's (1952) portfolio size optimization. The Technopolis report on European VCs (2011) also found that funds require sufficient size to follow-on invest in their best portfolio companies, suggesting a minimum fund size of £40m for a seed or early stage VC. However, Munari and Toschi (2014), in their pre GFC study of UK early stage VC fund performance, found that fund size was not the critical determinant of fund exit success. They suggest that a combination of market pipeline (which is poorer in technologically lagging UK regions) and regional investment restrictions, combined with agency failures attributed to the funding models are the more likely causes of under performance.

Private sector-led government funded VCs

Government VC funds perform better when they are private sector-led and invest in viable businesses. Lerner (2010) is particularly keen to take a global view in attracting the best skilled fund managers and inward investment to provide a demonstrator effect for new emerging fund managers to follow. This approach allows private fund managers to select investments, with government avoiding micro management of funds and acting in a monitoring capacity. This oversight role is crucial as Murray, Hyytinen and Maula (2009) and Kirk (2011) point out that it is important that investments are made within the parameters of the fund and avoid mission creep to safer, later stage funding strategies. Another key part of the private sector-led approach is the ability to leverage private co-investment funding, increasing fund size and engendering a private sector investment dynamic.

A long term view

Lerner (2010) suggests that it is necessary to take a long term view, with funds designed to operate for at least 10 years and with the flexibility to extend further in order to allow their portfolio firms to fully mature and avoid early sales and potential share value dilution. This has become highly pertinent post GFC as exits have taken longer (Pierrakis, 2010) and particularly as the investment 'plums' take longest to ripen (Wiltbank, 2005). On the other hand Murray, Hyytinen and Maula (2009) have found that evergreen funds may be more prone to mission creep and to a lack of dynamism which has led to long-term support for poorer performing portfolio companies.

Sufficient focus

It is imperative that there is a wide enough focus to meet a sufficiently good quality pipeline of investible businesses (Mason and Brown, 2013). The NAO (2009) report highlighted the failings of the UK government's Regional Venture Capital Funds, which were too small in scale and narrowly focused into English regions to generate a critical mass of investment and returns. On the other hand it is widely acknowledged that the most successful VCs have niche '*hard to imitate*' knowledge of sectors and stages (BIS, 2011) and are persistent performers

who build on their experience and networks over time (Gompers et al. 2010). It is therefore critical that VC models are designed and implemented appropriately for their local contexts (Wilson and Silva, 2012) utilising highly skilled fund managers and developing the local (regional or national) VC ecosystem in order to avoid agency (Akerlof, 1970) and connectivity failures (Amini, Keasey and Hudson, 2012). Taking forward Lerner's (2010) global approach to the VC ecosystem, successful connectivity may increasingly involve sector based syndication which is transnational (Hopp, 2010; SQW, 2015).

Methodology

The findings presented are primarily drawn from demand and supply-side interviews undertaken in February 2014. Demand-side interviews were undertaken with recipient business owner-managers of the ECF and ACF schemes using a CATI (6) telephone survey questionnaire containing core standardised quantitative questions supplemented by explanatory open qualitative questions. All interviews were recorded and entered into an SPSS database, enabling statistical analysis and qualitative content analysis of key dependent variable questions (such as success measures in accessing finance) by independent variable factors (such as business and financing characteristics). The surveyed businesses were randomly sampled from each scheme's full current recipient business portfolios (representing 166 ECF and 39 ACF businesses), being restricted only by survey timeframe constraints and requests from fund managers that portfolio businesses that had exited, closed or were undergoing exits should be excluded (representing 30 ECF and 1 ACF recipients). There were also 23 ECF refusals, with the owner-managers of the remaining 38 ECF businesses being unobtainable for interview within the survey time period of four weeks in February 2014. There were no refusals from the more recently established ACF scheme. Overall, the survey captured fully completed survey responses from 45% of the ECF and 41% of the ACF portfolios and is broadly representative of their respective recipient businesses.

The surveyed recipient businesses were profiled in terms of their age of establishment and stage in the business financing development cycle, sector and innovation activity, and UK regional location. They were then asked a series of questions under the following key headings: (i) funding round requirements for the business development stage at which the ECF or ACF scheme first provided finance, including the amount of funding required in the round, reasons for seeking finance, knowledge, consideration and application to other sources of finance and previous business financing activity experience; (ii) the amount of funding received from the scheme, including the date and perceived amounts of leveraged finance and additionality of the scheme's funding and any follow-on funding contributions; (iii) the performance levels of the funded businesses in terms of innovation development, direct and indirect (subcontractor) employment generation, annual sales turnover, exporting and profitability change, and the perceived degree of attribution to change due to the scheme's funding; (iv) future funding requirements, timescales and exit plans; (v) value added activities of fund managers and angel investors and suggestions for scheme improvements, including promotional visibility, scheme access and delivery. These management telephone interviews typically took 40 minutes, but in more complex cases could take well over one hour.

Additionally, supply-side interviews were undertaken, either face to face or by telephone (7), using semi-structured topic guides. These included fund managers representing all 15 ECFs at the time and 19 lead business angels involved in successful (16) and unsuccessful (5) business angel syndicate applications to the ACF (8). Again these interviews were quite similarly aligned for both schemes, including core questions in relation to scheme promotion and sourcing investments, degree of seed and early stage investment experience, experience in dealing with the British Business Bank (9) the government's management oversight organisation, investment performance and projections for exits, assessments of value added activities and of the scheme's impacts on the wider equity investment ecosystem. There were also specifically nuanced questions relating to each scheme, including for the ECF fund managers' experience of applying for second funds and for the ACF the lead angels' experience in applying to the scheme. These interviews typically took 1.5 hours and included follow-up clarification calls and transcribed text checks with the interviewee.

In order to gain greater insight into the wider seed and early stage equity investment ecosystem semi-structured topic guide key informant interviews were also held, either face to face or by telephone interview, with a wide range of 16 alternative investors and six stakeholder organisations. The alternative investors included other current institutional VC, VCT, angel capital fund, accelerator and crowd equity investors in the UK seed and early stage VC market. Whilst these interviews cannot be viewed as wholly representative of the UK early stage investment market, this market remains relatively small in terms of numbers of private VCs (10), and these interviews may be viewed as broadly indicative of the current market situation. The stakeholder interviews included relevant investor trade associations such as the British Venture Capital Association (BVCA), UK Business Angel Association (UKBAA), European Venture Capital Association (EVCA), as well as the European Investment Fund (EIF), Angel News and St John's Innovation Centre in Cambridge. These interviews typically took one hour and included transcription checks with the interviewees.

The current roles of the ECF and ACF

UK government expenditure on VC schemes increased almost three fold to £502.5m, from 2006-2011. During this period of escalating government investment the Enterprise Capital Funds (ECF) superseded the Regional Venture Capital Funds in 2006, initially with £240m invested into the first eight 'pathfinder' funds established between 2006-08 (see Table 1). The ECFs were designed to provide a demonstration model for early stage institutional VCs, by establishing a UK early stage VC ecosystem and encouraging new private fund managers into the market, with funds requiring a minimum of one third matching private sector investment, thereby addressing Lerner's (2010) recommendations for private sector led funds and private funding leverage.

(insert Table 1)

ECFs are a rolling programme, which currently total 17 funds (11). Each fund acts as a Limited Partnership (LP) with a planned ten year life cycle. They aim to address the equity gap facing high growth potential SMEs. Government funding is used alongside private sector funds to invest directly in businesses. The funds invest under the discretion of the private fund managers, targeting viable company investments of up to £2m with potential to provide a good commercial return. The ECF addresses different stages of business development, focusing mainly on seed and early stage investment. Some are generalist, covering a broad range of sectors (for example, Seraphim Capital Fund), whilst others specialise for example in new media (Dawn Capital Fund) and medical and healthcare investments (Oxford Technology Management Fund), reflecting the areas of fund management expertise.

In November 2010, the UK government extended the ECF investment period to 2015 with a further injection of £200m. Notably, the second £200m phase of eight ECFs (excluding the Catalyst fund) established since 2010, demonstrate a number of innovative and evolutionary changes. These include: typically larger fund sizes (rising on average from £26.9m to £42.7m) with greater provision for follow-on funding; earlier stage seed funds operating in accelerator environments (such as Passion Capital in London's Tech City); matching EIF funding and international European investments (exemplified by Notion Capital); and an East Midlands regional fund (Nottingham Foresight) which is not tightly restricted to regional investment, but which provides a bonus for within region investments.

The other major UK government equity scheme currently addressing the sub-£2m early stage equity investment gap is the £100m government funded Business Angel Co-investment Fund (ACF). Initially, this only operated in England from 2011, but was planned to include the rest of the UK from 2014. It focuses on the equity finance gap between £200,000 and £2m by match funding up to 49% of angel syndicate funding rounds of £100,000 and above, with a cap of £1m in government funding. Following the lead of the longer established Scottish Co-investment Fund, it aims to considerably extend the size of angel syndicate funding and to offer follow-on funding opportunities, thus ensuring a smoother flow of escalator finance and R&D and early stage marketing momentum (Mason, Botelho and Harrison, 2013). The ACF also intends to have a light touch, arms length approach, by relying on the business angels to

source viable deals and to manage the development of their ACF portfolio businesses, with the British Business Bank, providing government oversight for the scheme, only required to step in if the business runs into trouble and the angels are unable to address the problems.

The ACF also prioritises raising the level and quality of business angel syndication. This aim underpins the requirements for a minimum of three business angels to syndicate and that a lead angel prepares a proposition paper and presents to the scheme's independent investment committee in order to obtain funding. In this respect, the scheme is different from the Scottish Co-investment Fund, which automatically match-funds accredited angel syndicate deals, offering a speedier and more certain process. However, the ACF appears to have a similar impact in increasing syndication activity and raising the size of business angel investment rounds (Mason, Botelho and Harrison, 2013). The UK Business Angel Association (2013, p.3) reported that: *'By creating syndicates and leveraging co-investment funds, angels are moving up the valuation spectrum...'*, starting to fill the funding gap vacated by early stage VCs and that *'a new breed of super angels'* is providing both substantial funding rounds and extensive support to their portfolio businesses. The report indicated that angels are the main source of early stage investment in the UK, with 262 deals providing £137m in 2012/13 at an average deal size at £522,000 with the average angel investment being £324,000. The report also highlighted that 29 ACF deals over a similar period were able to lever much larger sized deals averaging £1.35m.

The above evidence of ECF and ACF developments in recent times, suggest that lessons from the NAO (2009) and internationally (Murray, Hyytinen and Maula, 2009; Murray and Lingelbach, 2009; Lerner, 2010; Technopolis, 2011) have been taken on board. The ECFs have evolved with a greater focus on larger scale, specialist funds; typically either generalists with no sector preference, focusing for example on seed and early stage investments, or sector specialists with a broad national or international coverage, being led by expert private sector fund managers and involving at least one third private co-investment contributions. The ACF offers an alternative UK co-investment scheme, developing the Scottish Co-investment Fund concept, enabling private business angel syndicates to lead in portfolio management.

This substantial evergreen fund not only facilitates larger initial investment rounds, but has the timescale and capacity to provide subsequent follow-on funding.

Findings from the Surveys

1. Are the schemes meeting a finance gap?

Drawing on the business recipient survey, and collective views of the ECF fund managers, ACF business angel investors, the alternative fund managers and investors and industry key informants, it would appear that both schemes have been addressing the equity financing needs of predominantly young, seed and early stage potential high growth businesses and that there is little evidence of funding duplication, either in terms of overlap between government funds or in relation to crowding out of private investors. Furthermore, there are strong signs of project additionality, and although these are not as strongly reflected in terms of financial additionality, these findings are in-line with other recent studies of UK equity schemes and are perhaps demonstrative of the over optimistic perceptions of surveyed owner managers.

At the time of initial scheme funding the surveyed recipient businesses were typically small, with a median employee size of 15 for ECF businesses and 11 for the ACF businesses. These businesses were typically either pre or early trading, with four fifths of the 36 ECF businesses funded since 2010 trading for less than four years at the time of the survey, whilst the equivalent trading age of the 15 surviving ACF businesses was a median of two years. These businesses were mainly seeking funding for R&D, early commercialisation of new products and services, key staff recruitment (such as technicians and sales staff), and working capital to fund growth.

From the perspective of rebalancing the UK economy it is notable that the ECF and ACF recipients represent a wide range of sectors. The largest concentration is in technology and

telecommunications (35% of recipient businesses in both schemes), but there are also notable concentrations of manufacturing business investments in the ECF scheme (35%) and health and consumer services sector investments in the ACF scheme (both 20%). Whilst there is a spread of business investments across the nine English regions (and into Wales and Scotland in the case of the ECF), London, the South East and East of England regions dominate both schemes', containing around two thirds of portfolio businesses (62% of ACF and 68% of ECF investments). However, this apparent regional imbalance is distorted by a number of factors worthy of a separate study, which primarily include the concentration of increased numbers of small-scale business investments by London based seed ECFs, the roles of other EU funded regional funds (in Wales and the North of England) and the dominance of organised regional business angel networks, notably in London, in putting up syndicates for the ACF.

The vast majority of ECF businesses (65%) had not received previous rounds of equity, generally reflecting their earlier stage development at the time of scheme application, whilst two thirds of the ACF businesses had done so, mainly from business angels which in some cases had introduced them to the scheme (12), but also in one in five cases from University spin-out funds, small seed VCs and public regional funds.

The recipient businesses described themselves as typical 'gap funding' candidates:

We're too early stage for institutional and corporate VC funding - they tell us to come back when we have evidence of greater market traction - but we require too much funding for individual angels or groups of angels to fund.

A key finding is that the ACF is mainly funding significant 'series A' early commercialisation venture rounds, whilst the ECFs exhibit a greater mix of seed and 'series A' investment. This is reflected in their respective funding requirements which ranged from £20,000 for seed investment to just over £8m amongst the ECF businesses, with a mean round requirement of

£964,000. For the ACF businesses this ranged from the minimum £200,000 up to £9m for a later stage expansion deal, with a mean funding round requirement of £1.5m.

In the vast majority of cases all of the required funding was received, representing 90% in aggregate for the ECF and 98% for the ACF recipient businesses. The typically larger scale and size of the ACF deals compared to the ECF is also borne out in the average shareholdings; 19% for ECF and just over 9% for ACF. Overall, there has been a move towards more seed and earlier stage funding since 2010 amongst the ECFs, with the average funding to recipient businesses falling from £1.14m pre 2010 to £547,000 post 2010.

Extent of funding duplication and leverage

Whilst it is clear from the recipient business surveys that both schemes have funded young, innovative R&D and growth oriented businesses it is important to ascertain the extent to which this funding duplicated existing public or private funding opportunities in the market (Leleux and Surlemont, 2003).

Half of the surveyed ECF recipients had sought alternative funding prior to applying for ECF, with one in ten receiving offers which were rejected in favour of the ECF. Alternative sources were mainly rejected because they were insufficient and in the case of business angel finance, which required syndication to raise sufficient size funds, it was *'too fragmented, complex and time consuming to consider.'* In the very few examples where choice of private or public VCs existed ECF was preferred due to fund managers and the growth opportunities offered. These managers explained that *'alternative early stage corporate VC would be restrictive in terms of product and market development'* and that *'it had nothing to do with the cost of the finance and everything to do with the compatibility of the fund manager'*, particularly in respect of industry sector and stage of development. Two thirds of surveyed ACF recipients had sought alternative funding, mainly from angels, but had struggled to raise sufficient funds over a typical search period of six months. Bank finance was mainly out of the

question, as the businesses were too risky, being early stage without a trading track record of at least two years (confirming the findings of North, Baldock and Ullah, 2013; GLA, 2013).

Neither scheme requires additional private funding leverage. For the ACF, the angel syndicate funding is already in place at the time of the application for the scheme to match. The ECFs' (which already contain a minimum of one third private co-investment finance) portfolio companies received double the amount of investment at the time of the initial ECF investment. Their surveyed managers considered only 2% of this additional funding to be duplicative, in that it would definitely have replaced ECF investment, and attributed almost half (46%; 1:0.46 ratio) as leveraged by the scheme. Post 2010 additional and leveraged funding has mainly come from business angels and VCs in syndication for very early stage investments, supporting Hopp's (2010) contention that seed VCs find benefits in syndication. Interestingly, where additional funding was attributed to ACF leverage, a similar ratio of 1:0.5 was recorded. This funding came from a variety of sources, including public and private VCs and a very small proportion of public and private debt finance.

Additionality or displacement

Fund managers, business angel investors and industry stakeholder informants all indicated that the ECF and ACF schemes have an important role to play in the UK seed and early stage risk equity finance market, due to the perceived continuation of the equity funding gap, which many now felt extended well above the £2m EU state aid ceiling on these schemes. Their prevailing view was that without these schemes the financing requirements of their recipient businesses would not be met. Furthermore, the business surveys revealed little evidence of funding duplication or alternative funding being rejected.

The surveyed alternative equity fund managers and industry informants also supported this view, indicating that few institutional VCs or VCTs operate at below £2m, or in the early stage UK markets, preferring to specialise in expansion and MBO/MBI activities (see Table 2). The exceptions are a few emerging seed VCs in London (such as EC1, Connect Ventures and

Playfair Capital) and notably Octopus VCT, a specialist early stage investor whose portfolio included *LoveFilm* which was acquired by Amazon in 2011 for £200m. The other interesting phenomenon, particularly in the London market (GLA, 213) has been the growth of seed investment accelerators (for example Seedcamp, London's first accelerator established in 2007) and of angel capital funds (including #1 Seed and Wren Capital) operating in the seed and early stage market.

(insert table 2)

A further measure of whether the schemes were addressing an equity gap is to examine the degree of additionality or displacement taking place, recorded in the perceptions of the surveyed recipient business managers. A caveat here is that both the fund manager and business angel investor groups indicated that their portfolio business managers are typically overly optimistic in their expectations of raising alternative funds, and these suggestions are strongly supported by the funding received data.

(insert Table 3)

The surveyed ECF and ACF businesses (Table 3) exhibit high levels of project additionality, but lower levels of funding additionality. These findings are consistent with other recent studies of UK equity scheme studies (BIS, 2010 and 2012). In the opinion of one fifth of ACF and one quarter of ECF recipient business managers the funded project would not have been able to go ahead without scheme funding. However, it is evident that a high proportion of the surveyed managers (53% of ACF and 61% of ECF) believe that obtaining alternative funding would have resulted in either delays (typically of 6-12 months), or a scaling down of the project due to less funding being available. Surveyed business managers were quick to mention that delays in getting potentially globally leading technology into the market to obtain market primacy could severely jeopardise the ultimate success of the business. This assertion

is similar to those made by managers of young innovative businesses in recent UK studies examining access to early stage equity finance (BIS, 2012; North, Baldock and Ullah, 2013).

Also, as already mentioned, and recorded in several recent UK studies (BIS, 2010 and 2012), the choice of VC fund manager, or angel investor is crucial in order to get an alignment of business development aims and the right level of appropriate management input into areas such as financial management, sales and marketing, export market developments, networking contacts and linkages to further funding. These findings support the Gompers et al. (2010) postulation of better performing VCs possessing niche management and sector skills to deliver successful investment outcomes and that the funding model is crucial (Wilson and Silva, 2012).

2. Assessing model suitability: Are the funds large, flexible and focused enough?

Ultimately, as Lerner (2010) has stated, the success of government VC schemes will be judged on their fund return performance achieved through successful portfolio company exits and the establishment of legacy private sector funds operating independent of public funding in the seed and early stage VC markets. Therefore, a contemporary interim snapshot view of fund performance may be argued to be fundamentally flawed, as it will be unable to provide the traditional measure of fund success relating to the number and value of positive exits (Munari and Toschi, 2014). Indeed, Wiltbank (2005) found that it can take a decade or more for the 'plum' exits to take place and with exit timetables telescoping due to the GFC (Pierrakis, 2010; CfEL, 2013) it should be noted that in 2013-14 the Scottish Investment Bank (which includes the ten year old Scottish Co-investment Fund in its remit) reported only eight exits from a portfolio of 262 companies. However, as Lerner (2010) also suggests, there is a need for interim scheme assessment to check if the model approach is working and make appropriate adjustments. Also, from a broader economic development standpoint Baldock and North (2015) indicate a more immediate need for a range of other types of success measures. Here, we assess the limitations of a traditional benchmarking approach of fund

performance (Wilson and Silva, 2012) and widen the scope of assessment by drawing on a broad range of primary fund manager, business angel investor and portfolio company evidence of the fund performance and the wider current economic impacts of the schemes, providing insight into current and future scheme performance.

Interim ECF performance: the need for flexible timescales

In assessing fund performance, the majority of older established ECFs (pre 2010) had set out with aims of achieving at least 3x multiples on their investments, but fund managers now recognised that they would do well to achieve between 2-3x. Most would be seeking up to two years extension to their 10 year funds in order to manage their stronger performing portfolio companies to an optimal exit point, with trade sales representing their preferred exit route. The limited internal rate of return (IRR) data provided was below expectations, supporting the view that it is still too early to make a clear evaluation of fund performance, even after between four to eight years and that baseline analysis with Preqin's (13) equivalent aged European private sector VC funds is of little value, because these are typically self reported by the better performing funds, many of which do not operate at early stage investment and that early stage investments take longer to mature (Wilson and Silva, 2012). Furthermore, the ECF fund managers were able to point to one or two notable successes where portfolio companies were highly likely to achieve 10x multiples, but the realisation of these exit returns would not be taking place for several years yet. Whilst it is far too early to assess the ACF in this way, several UK industry stakeholder experts commented that the scheme's evergreen design potentially overcomes the problems of delayed exits and the contributory effects of delayed interim follow-on funding.

Funds size and scale: the need for second funds

Whilst this paper ostensibly examines the overall performance of the ACF and ECF schemes, to achieve Lerner's (2010) lasting legacy, the ECF's individual funds will need to roll out as future fully privately funded. In this respect both the surveyed private sector VC fund

managers and ECF fund managers stressed the point that ECFs continue to be too small and would have far more chance of generating a sustainable legacy if they were at least double their current average size of circa £35m, considerably above the Technopolis (2011) recommendation of £40m. Several fund managers mentioned that funds closer to £100m would be able to make the number and range of investments to meet Markowitz (1952) criteria of an optimum of 30 investments and have a realistic chance of backing the most successful portfolio businesses through to 100 plus employee size and £100m plus trade sales or IPOs. In this respect they support Cumming's (2011; forthcoming) view that VCs ideally follow their portfolio businesses through early stage investment phases to an optimal exit point, although as Hopp (2010) suggests, seed VCs may strategically relinquish their lead investor role through syndication to enable more suited later stage VCs to take the portfolio company to optimal exit.

A further related hindrance is the perceived lack of support for ECF second funds, with several existing ECF fund managers finding it difficult to get further scheme funding within the five year cycle they would like to operate. Thus far, only three (Oxford Technology, Amadeus, IQ) out of the eight original pathfinder funds have successfully obtained second funds. The surveyed industry stakeholders and fund managers generally believe that for the ECFs to become sustainable this requires the generation of second funds to facilitate new portfolio investments and enable substantially follow-on funding to selected existing portfolio companies.

Fund managers also mentioned that fund raising had been difficult post GFC, exacerbated by the UK's fragmented institutional investor community. This is highlighted by a lack of large-scale pension funds available and willing to back early stage VCs. It was thought that larger, potentially more sustainable ECFs would prove more attractive and have greater opportunity of raising these funds. Finally, the EC ruling on 22nd January 2014 to approve public funds up to £50m and allow the state aid cap to rise to £5m for initial individual business investments, with follow-on cumulative investment up to £12m was warmly welcomed. This would provide greater fund sustainability, enabling greater follow-on funding for the better performing

portfolio companies. It was also agreed that increasing funding to £5m will address the perceived expansion of the UK's early stage equity gap at above £2m (BIS, 2014) and provide 'Rowlands gap' (2009) funding to intensive R&D companies that do not have sufficient trading records to qualify for the Business Growth Fund, or attract institutional VC.

Current impact measures

Arguably, a more effective and useful way of addressing Lerner's (2010) requirement for interim evaluations, is to examine whether the schemes are making attributable impacts on their portfolio companies and to gauge their wider economic impacts on the UK economy. Here we examine the responses of the surveyed managers, looking at what has been achieved since receiving scheme funding and projections for future growth. A caveat here is that fund managers consistently recognise that their portfolio business managers' projections are rarely achieved (BIS, 2010, 2012 and 2014).

Table 5 presents a comparison of the actual performance of surveyed ECF and ACF recipient businesses since the time of their initial funding until the time of interview in February 2014. Figures in parenthesis are for the sub-set of 36 ECF recipient businesses since 2010, where it is more helpful to compare their performance with the more recently funded ACF businesses. The table provides key economic policy related impacts in terms of overall employment generation, business income generation and innovation, but it should be noted that these are from a subset of compliant surviving businesses and that the degree of attribution to each scheme also needs to be taken into account, given that in many cases other matching funds have also been invested.

(insert table 5)

Overall, in terms of both aggregate sales turnover and employment growth since receiving initial scheme funding, the surveyed ACF and ECF recipient businesses have performed well. The ACF recipient businesses doubled their employment since receiving their funding in the previous two years, with their aggregate sales turnover increasing by nearly three fifths. Whilst the ECFs exhibited overall slightly lower proportional employment growth and considerably higher sales turnover growth, it is more appropriate to compare the performance of those assisted post GFC since 2010. This presents a higher rate of employment growth and slightly higher rate of sales turnover growth than for their ACF counterparts. A further spill-over impact recorded in both surveys was the rapid parallel growth in contract labour (e.g. IT, technical production, sales and manufacturing jobs). For example the ECF recipients experienced an increase of 203 subcontracting jobs since funding, a proportional increase of 231%, demonstrating the flexible labour requirements of these businesses in order to facilitate growth (North, Baldock and Ullah, 2013) and it was notable that whilst jobs could be based overseas, the vast majority of these jobs were undertaken in the UK, often remotely.

The vast majority of surveyed businesses had also increased their level of innovation since funding, with ECF recipients exhibiting high proportions improving products, services, marketing and processes (all 75% or higher), whilst half of the ACF firms had introduced new or improved patents and copyrights. Profitability was more complicated to measure and it was clear that the older established ECF recipients were taking longer to gain market traction than originally planned, whilst the number of ACF firms in profit had actually declined, with one business using investment to focus on R&D rather than sales. ECF fund managers and business angels surveyed also commented that the sharp rise into profitability exhibited in the traditional 'J' curve was not yet being experienced, with the vast majority of businesses still languishing deep in the valley of R&D and early commercialisation costs.

A potentially useful indicator of scheme impact is the degree of attribution accorded by the surveyed managers of the scheme's funding to business growth and development. In this respect, it is notable that both schemes scored more highly in terms of their proportional attribution to growth than their proportion of external project funding received (i.e. in the

relevant funding round). The indication is that ACF (11%) and ECF (10%) had both provided net positive catalytic impacts on business growth performance to date. The lower proportion of attribution presented by ECF recipient businesses since 2010 is reflective of the increased levels of syndication and lower proportion of ECF funding in seed and early round investments post GFC (Hopp, 2010); for example, the median level of ECF investment after 2010 was £255,000, with median additional funding of £550,000.

Another strong finding from the ECF survey is that 93% of recipients experienced management improvements, particularly relating to corporate practices (74%) since initial funding. ECF fund managers have been able to introduce improved financial management and strengthened their portfolio management teams, either by their own presence on the board as NEDs, or by selective board appointments, such as in relation to sales and marketing. These findings support previous assertions that VCs can add value to the performance of their portfolio companies (Baygan and Freudenberg, 2000; Gompers et al. 2010).

Future business performance predictions are highly subjective and are mainly confined here to a one year forecast which demonstrates considerable further aggregate job and sales turnover growth, particularly in proportional terms, amongst the more recent ECF and ACF investee businesses. The three year sales turnover prediction has been included as a broad indicator of what the value of these businesses might be at a time closer to exit. This shows remarkably similar figures, with the average sales turnover of ECF and ACF businesses predicted between £10-12m.

Follow-on funding

An important finding from the research was the high proportion of surveyed ACF (67%) and ECF (83% of those funded since 2010) businesses that were requiring follow-on funding within the next year. The amounts required ranged from £100,000 for working capital to £20m of private equity to fund major international trading growth in a life science business, prior to

an initial public offering (IPO). The typical (mean £3.9m, median £3m) follow on investment required is substantial, with a common theme being a requirement for funding to continue the momentum of growth through the early marketing phase in order to establish (often global) market leading positions.

The majority (75% of ECF firms) would be seeking institutional VC and private equity, with around one third seeking further public equity funding, and with few being in a position to raise debt funding (i.e. they did not have sufficient trading record, or profitability). A clear benefit of ECF and ACF involvement has been the improved confidence of businesses in their ability to raise finance in the future (92% of ECF firms). Around one third of ACF recipients believed that the scheme would provide adequate follow-on investment and they expressed a preference for continued business angel funding where possible, rather than VC funding, but with their angel investors suggesting that the scheme gave them a much stronger position to negotiate better terms with potential VC investors. The recent UKBAA conference (January, 2014) also highlighted the potential role for the Business Growth Fund (BGF) to follow-on fund between £2-10m, once these businesses have more substantial sales turnover of around £5m per annum.

Post GFC, both ECF and ACF investors are giving far greater consideration to retaining sufficient funds in order to provide follow-on funding for their better performing portfolio businesses to support the flow of their development. This approach is particularly evident amongst more recently established seed and early stage ECFs (e.g. Passion and Episode 1). They initially invest small amounts in a large number of businesses and follow-on fund more substantial amounts into their better performers, conforming to Markowitz (1952) principles. However, both schemes have been hampered by EU state aid restrictions relating to the £2m limit on individual investments and in the case of ECFs the 10% limit on individual portfolio businesses relating to their fund size (i.e. a £35m fund has a £3.5m investment limit for each portfolio business). These findings strongly support the Lerner (2010) and Technopolis (2011) recommendations for larger scale HVCFs with greater flexibility to fund their portfolio businesses.

Exit Strategies: the need for more advanced planning

Ultimately the success of the schemes will be dependent upon the quality of the exit market. This was reported as very tough in the UK during the post GFC period (UKBAA Exits conference, 29/01/2014) but, as forecast, improved during 2014, with some signs of revival in the UK AIM market for smaller cap progression into public equity. For example, Spring 2014 saw the successful £120m flotation of Horizon, a UKIIF assisted Cambridge based life science company. Likewise, notable trade sales, within the currently depressed UK trade sale market rather than to US or other international corporates, will increase confidence and establish a more buoyant UK exit market. Concerns persist that too many UK HVCFs sell out their prized portfolio assets under value, because they cannot afford to follow-on fund and keep businesses until they achieve real size, market traction and sustainability (BIS, 2014).

Wiltbank (2005) recognised that early exit sales are often poorer performing 'lemons', whilst the best performing 'plums' take far longer to ripen. This sentiment is borne out by the fund manager feedback, which formed two viewpoints. Firstly, the top 10% of 10x plus performing multiple portfolio firm investments which really make a difference in the overall fund performance can take as long as 10 years to mature. Secondly, that a major impact of the GFC has been to set-back many of the older portfolio investments by two years, lengthening the average time to exit to between 5-7 years, whilst for the more recent ACF investee businesses the average time to exit is forecast at four years. Lengthening times to exit were also recorded in a longitudinal study of 32 older established ECF, Aspire and UKIIF portfolio businesses, which had extended on average by 1.5 years to 6.5 years in total (Baldock, 2014) and were also reported by Pierrakis (2010) and the CfEL (2013) fund manager report. A major repercussion of this is the need for flexible fund management timescales (Lerner, 2010). In this respect the evergreen approach of ACF is potentially better placed than the ECFs which have limited partnership agreements of 10 years with options to extend up to 12 years (BIS, 2014).

Surveyed fund managers and business angels (North, Baldock and Ullah, 2013; BIS 2014) exhibited a much stronger emphasis on planning their investment exit from the point of initial investment than was previously the case pre GFC. There is widespread acceptance that *'...it is no longer sufficient to invest in a good business in the expectation that it will sell itself.'* Indeed, ACF funding requires that proposals set out exit strategies and timescales and it is apparent that both ACF angel investors and ECF fund managers, along with their portfolio business managers, are taking time to contact and network with potential trade buyers, or future VC investors, with seed VCs in particular being keen to work with potential follow-on investors at the full 'series A' (14) stage, a point at which they may no longer wish to be the lead investor.

The survey revealed 3 ECF exits and one ACF exit thus far, all via trade sale acquisitions at multiples ranging from 2-5x, whilst both schemes have experienced write-down failure rates of around 10%. These failure rates appear quite low and there is a concern voiced by fund managers and business angels that they are not always efficient enough in culling poorer performing portfolio businesses and focusing sufficiently on their star performers. Failure to write down businesses can result in sub-optimal fund performance (Markowitz, 1952), with valuable resources relating to fund manager time and investments going into propping up 'zombie' companies which have no realistic chance of survival and growth.

With regard to future exits, the surveyed ECF businesses revealed that three fifths of exits are likely to be via trade sales, almost one fifth to private equity takeovers, and less than one in ten by IPO, suggesting a continuing perception of weakness in the AIM market which traditionally attracts closer to 20% of VC exits in boom times (BIS, 2013). An important observation is that just over half of the managers seeking trade sales expect the business to remain wholly in the UK and over a further third expect a core R&D element to remain. Similarly three quarters of ACF exits were predominantly aiming for trade sales, whereas just one fifth were considering IPOs. All of the managers seeking trade sales expected their businesses to retain a presence in the UK. Furthermore, a more detailed examination of the ECF managers seeking trade sales indicates that those continuing to work will seek

managerial roles in existing (50%) or new (36%) UK companies and those that reinvest (43%) will do so in UK businesses, suggesting that future funding and IP spin-out development from ECF exit companies will take place in the UK and therefore supporting Lerner's (2010) global free market approach to HVCF operation.

3. The Evolving Post GFC UK Finance Escalator

Here the developing roles of the ECF and ACF are discussed, focusing on how they fit within the currently evolving, post GFC UK finance escalator and their potential development. It is important to view both schemes in the wider context of their design. Whilst there is general consensus from the supply and demand side surveys that both schemes are addressing the UK's sub-£2m equity finance gap for potential high growth SMEs, there is some debate as to whether they have the scale and reach to make a significant difference and impact on the wider UK early stage equity finance ecosystem.

Potential impact on the wider UK ecosystem

There is mixed evidence of the impacts of ACF and ECF on the wider UK equity finance market. They collectively represent less than ten per cent of the UK's £350m annual seed and early stage equity market (BVCA, 2013; Mason and Pierrakis, 2013). Industry experts, fund managers and business angels all indicated that these schemes will benefit when high profile exits make them more attractive to businesses and investors. The ACF's evergreen model provides a flexibility of timescale and follow-on funding that complies with Lerner's (2010) recommendations, but could fall foul of government micro-management issues if it has to step in to address angel investors' portfolio management failures. The ECFs exhibit Lerner's global equity eco-system development thesis, attracting global fund managers and investment and spinning out new fund managers. However, they lack size and scalability through second cycle funds to meet Markowitz (1952) investment scale for the substantive follow-on funding required by current portfolio firms. This is perceived as the way ECFs can establish Lerner's (2010) sustainable private sector legacy.

Complementary or competing finance models?

Our demand and supply-side surveys found little current evidence of any competition between the ECF and ACF schemes. The only evidence of private sector VCs is at the seed stage in

London, where there is also evidence of increasing numbers of angel capital funds, but these are operating at the lower end of the equity market, typically well under the £200,000 level, or in angel syndicates with average investments of around the £500,000 level (Deloitte, 2013). However, due to the recent increase in accelerator finance and attraction of new start-ups in the London region, it remains an underserved market (GLA, 2013).

Current evidence supports the continuing need for these funds and the remaining question is the extent to which they may be competing with each other in the future. At present the ACF is a fledgling scheme and the survey evidence suggests that there is very little overlap. A major reason, evident in the business surveys, is the owner-manager's preferences between angel and VC funding, with some managers clearly stating that they will not use one or the other, supporting Norton's (1991) entrepreneurial preference pecking order. For example, VCs are perceived by some as '*controlling and preoccupied with exits*', whilst for others business angel finance is considered '*small-scale, fragmented, complex and time consuming to obtain*.' A second reason is that the ACF is co-finance stretch-funding business angel syndicate deals and these can include syndication with other public and private VCs. Thirdly, in the current market, there is a widely reported escalating demand for 'series A' finance in the UK (GLA, 2013; British Business Bank, 2015) and across Europe (SQW, forthcoming) which public equity funds are only addressing a small proportion of and which the private sector has largely abdicated. Clearly, as the ACF grows in scale, it could potentially duplicate other public funding in the early stage market, but this appears unlikely, particularly as the new breed of Super ECFs, with powers to invest up to £5m (Van Der Schans, 2014), and marked by the British Business Bank (2014) announcement of the new IQ Capital Fund 2, are likely to focus on the larger 'series A' and 'B' growth funding deals at above the level of ACF.

Towards a new UK Finance Escalator?

Taking on board the continuing decline of institutional private VC activity in early stage investment in the UK post GFC, many commentators (Gill, 2014; Harrison, 2014; Tooth, 2014; Baldock, 2014) are presenting new updated versions of the UK finance escalator, pipeline, or

ecosystem models (Mason and Brown, 2013). These are increasingly removing bank and debt finance from the equation, as apart from for 'soft starts' which quickly achieve trading records, or start-ups with collateral (such as existing business spin-outs), this type of finance is rarely available to young businesses with less than two years trading record (GLA, 2013). It is also recognised that seed grants from Innovate UK (15) and Scottish Enterprise (SMART awards) continue to play an important role in proof of concept and developing young R&D based businesses (North, Baldock and Ullah, 2013; Mason and Brown, 2013).

(insert table 4)

Focusing on the formal and informal equity finance ecosystem, Table 4 presents the main changes, post GFC, in the UK supply channel of seed and early stage funding and positions the ECF and ACF within this. These changes can be summarised as:

1. The further retreat of institutional VC from early to later stage investments (Mason, Jones and Wells, 2010; North, Baldock and Ullah, 2013)
2. The development of some earlier stage corporate VC investment in the Pharmaceutical market (Cave, 2009).
3. Some extension of HVCFs beyond the EU state aid cap of £2m through the UKIIF and Notion ECF which both utilise additional European Investment Fund finance, giving them pan European investment capabilities (British Business Bank, 2015). This trend is set to increase in the future with the new breed of Super ECFs operating under the new state aid cap of £5m.
4. The rise of angel capital funds, super angels, syndicates and stretch funding through the ACF, enabling business angels to take up the early stage investment space vacated by institutional VCs (Deloitte, 2013). Angel capital funds represent a key emerging formalisation of small syndicates, often with two or three investors, providing a mix of management skills, from CEO to finance and technical, and

investment experience to provide a '*super smart combination of investor skills*' (British Business Bank, 2015).

5. The introduction of new seed VCs, following the example of Passion ECF, typically operating in syndication with other VCs and angels in very low level investments within accelerator environments like White Bear Yard in London's Tech City (GLA, 2013; British Business Bank, 2015) and supporting Hopp's (2010) position on the importance of syndication in seed investment.
6. Accelerator investor programmes hot-housing potential high growth start-up businesses. Seedcamp was the first in London in 2007 and there has been growing corporate venturing interest in London as a centre for new tech start-ups since (GLA, 2013). Currently 15 out of 25 UK accelerators are located in London (16) and recent studies (SQW, 2015; GLA 2013) indicate that these are attracting entrepreneurs from across Europe and providing a pipeline of viable seed businesses.
7. Seed crowd equity platforms introduced into the UK in 2011 by Crowdcube and Seedrs (GLA, 2013). Collins, Swart and Zhang (2013) found that the UK crowd equity market was £28m in 2013, but predict that it will rapidly grow in size.

Conclusions

Drawing on the collective demand and supply-side evidence presented, it would appear that both the ECF and ACF schemes have been addressing the equity financing needs of predominantly young, seed and early stage potential high growth businesses. There is little evidence of funding duplication between government funds or in relation to crowding out of private investors. There are also strong signs of additionality in both schemes, particularly in terms of leveraging and facilitating sufficient funding to maintain business scale and development trajectory to achieve desired market niche and primacy goals.

The interim nature of the scheme analysis undertaken revealed the limitations of standard fund evaluations based upon exits and return on investments at this stage. However,

contemporary measurement of attributable scheme impacts on portfolio businesses and the wider economy provided important indicators, with both schemes contributing to employment generation, sales turnover increase, improvements in innovation and business management. Spill-over impacts also included considerable contract employment generation within the UK and indications that trade sales, which may largely be to foreign buyers, will lead to the retention of jobs, R&D and reinvestment within the UK, all supporting Lerner's (2010) global vision of VC.

There was widespread evidence that the current size of the ECFs is still not great enough to adequately meet the current and forecast strong demand for high levels of follow-on funding to enable portfolio companies to reach their optimal exit size. Neither is it clear that the flexible addition of two years to the current ECF LP 10 year lifespan is sufficient to enable this, given the extended exit horizons created by the GFC. In this respect, the granting of more second funds to facilitate fund development and scale could: lever out more private investment through the greater attraction of scale to institutional investors; enable greater range of portfolio investment to meet Markowitz (1952) proportions; and allow sufficient follow-on investment for these funds to realise their full potential and leave a lasting private sector legacy. In this respect, the evergreen design of the ACF was seen as advantageous and more likely to facilitate a sustainable model enabling a smooth flow of follow-on funding.

The ECF and ACF currently hold important roles within the evolving post GFC UK finance escalator. They do not currently duplicate each other, due mainly to the current division of these resources, with more recent ECFs focusing on seed investments and the ACF focusing towards 'series A'. As the ACF develops in scale there is potential for scheme overlap.

However, in this respect the research confirmed Norton's (1991) entrepreneurs' pecking order preferences between types of equity finance and Hopp's (2010) importance of syndication in seed and early stage investment, suggesting that both schemes can complement each other and co-exist. Furthermore, in the future the Super ECFs will be able to operate in the £2-5m investment arena on a scale and level which should fill the gap between the current ACF and ECFs and the Business Growth Fund.

The research presented is limited by its cross-sectional and interim nature and will benefit from follow-up, longitudinal research, which can evaluate the longer term impacts of the schemes over time, particularly in respect to fund performance, geographical and sector reach and legacies for the UK VC ecosystem. Overall, the signs from this paper are that the new post GFC UK finance escalator is developing in the right direction.

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End Notes:

- (1) Breedon (2012) estimated the UK business finance gap at upwards of £84bn between 2012-16
- (2). UK Coalition Government Chancellor of the Exchequer, George Osborne, Autumn Statement 03/12/2014
- (3) EU Joint European Resources for Micro and Medium Enterprises (JEREMIEs) operate funds offering up to the former EU state aid limit of £2m in the North West, Yorkshire and the Humber, North East regions and Wales.
- (4) The two main investor tax breaks relate to the Seed Enterprise Investment Scheme (SEIS) and Enterprise Investment Scheme (EIS). EIS qualifying SMEs have less than 250 employees and £15m in assets. SEIS qualifying firms have less than 25 employees and £200,000 in assets.
- (5) In 2011 UK intangible asset investment recovered to £137.5bn, whilst tangible asset investment was flat at £89.8bn (Nesta, 2014).
- (6) Computer automated telephone interview (CATI) process
- (7) There was an approximate 50/50 split between face to face and telephone interviews for both the supply-side and key informant interview survey elements
- (8) Lead angels are required by the ACF to apply on behalf of their prospective portfolio companies to the scheme for funding and can apply on behalf of more than one company. The survey therefore included a couple of lead angels that had experienced both successful and unsuccessful applications.
- (9) The schemes were formerly overseen on behalf of the UK government by Capital for Enterprise Ltd (CfEL), until 2013.
- (10) BVCA (2014) membership data suggests that only 41 UK VC funds have been established since 2010 and that the majority of these operate in later stage investments.
- (11) Includes two recently established funds not included in the study: the Catalyst Fund which tops up multiple private funds to enable fund raising closure; the IQ Capital Fund 2 announced on 01/12/2014.

(12) The ACF prohibits existing business angel investors in applicant companies from leading syndicates in scheme applications.

(13) Preqin is the alternative assets industry's leading source of global and European market information

(14) 'Series A' refers to the first substantive VC investment at the early commercialisation stage

(15) Formerly known as the Technology Strategy Board (TSB)

(16) Entrepreneur Handbook (2014) www.entrepreneurhandbook.co.uk/business-accelerators/

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Table 1: Chronology of UK Government Equity Finance Schemes operating in the sub-£2m equity gap for SMEs 2000-2014

Year started	Scheme	Objectives	Fund size/ Govt input	Maximum initial investment
2000	UK High Technology Fund	Show commercial returns from early stage high tech investment Attract new longer term institutional investors	£126m £20m	No limit
2002	Regional VC Funds (RVCFs)	Regional VC to attract private investment, address equity gap Raise SME risk capital and avoid displacement	£224m £74.4m	£500,000
2002	Bridges Funds	VC for most deprived 25% of areas in England (2 funds)	£40m £20m	£500,000 No limit on 2 nd fund
2002	Early Growth Funds	Show commercial returns in early growth business investments	£91m £26.5m	£100,000
2006	Enterprise Capital Funds (ECFs)	Increase fund managers entering early stage investment market Attract investors and become self funding in mid term (15 funds)	c.£322m* £240m plus £200m (2011) £400m (2014)	£2m raised to £5m in January 2014
2008	Aspire Fund	Increase women led growth businesses in UK Improve links between providers and investor readiness support	At least £25m* £12.5m	£1m
2009	Capital for Enterprise Fund (CfEF)	One year fund to support viable existing businesses raise new long term finance, including where over-leveraged	£75m £50m	£2m
2010	UK Innovation Investment Fund (UKIIF)	Investment at all stages into strategic high growth businesses in: digital, life sciences, clean tech and advanced manufacturing.	£330m* £150m	No limit
2011	Business Angel Co-investment Fund (ACF)	Encouraging high quality business angel syndicate co-investment	£200m* £50m plus £50m (2013)	£1m

Sources: National Audit Office (2009); BIS, 2013a; Capital for Enterprise Ltd (CfEL), 2013

Note: * Funds still operating

Excludes:

- (i) JEREMIE (2007-15) regional funds of £370m in NW, NE, and Yorkshire and the Humber as these are match funded by ERDF and EIB with UK government oversight costs
- (ii) Business Finance Partnership funds of £1.2bn aimed at generating alternative lending and mezzanine funds. Includes £240m, in match funded arrangements with 7 providers to SMEs.
- (iii) Indirect tax schemes such as Seed Enterprise Investment Scheme (SEIS), Enterprise Investment Scheme (EIS) and Venture Capital Trusts (VCTs).
- (iv) VC funds specific to Scotland, Wales or Northern Ireland
- (v) Business Growth Fund, formed by BIS with five leading UK banks in 2011, providing equity finance between £2-10m for established UK businesses with £5-100m annual sales turnover.
- (vi) Devolved government funds e.g. Scottish Co-investment Fund and various ERDF backed programmes in Wales and Northern Ireland.
- (vii) 2013 ECF Venture Capital Catalyst Fund £25m to top-up viable VC fund closes.

Table 2: Examples of Current UK Private Equity Fund Activity

Type of Investment Organisation	Number of funds (n=13)	Fund Size Range	Range of Deals	Average Multiples
Private Venture Capitalists*	4	£30m-£200m	£1-20m	3-5x
Seed Venture Capital Funds	3	£10m-£20m	£50k-£1m	3-5x
Venture Capital Trusts	3	£20m-£50m	£1m-£25m	3x
Angel Capital Funds	3	<£10m	£25k-£100k	5x

Source: British Business Bank (2015)

Table 3: Key Early and Interim Portfolio Business Performance Measures

Metrics	ECF (2006-2013) n=75 (since 2010 n=36)	ACF (2011-2013) N=15
Actual Performance since funding		
Aggregate job creation	758	110
% increase in aggregate jobs	85% (138% since 2010)	100%
Aggregate sales turnover increase	£56.86m	£2.45m
% increase in aggregate sales turnover	170% (64% since 2010)	59.3%
In profit	21% (7% since 2010)	7%
% change in profitable businesses	5% (11% since 2010)	-7%
Innovation improvements	93%	100%
Average % attribution to scheme	59% (46% since 2010)	37%
Average % scheme funding	49%	26%
Future one year prediction – change based on current performance		
Aggregate job creation	670	177
% increase in aggregate jobs	41% (83% since 2010)	77.5%
Aggregate sales turnover increase	£46.11m	£19.14m
% change in aggregates sales turnover	55% (145% since 2010)	286.4%
Future three year prediction – change based on current performance		
Aggregate sales turnover increase	£460m	135.82m
% change in aggregates sales turnover	227% (431% since 2010)	2033%
Average sales turnover	£11.6m	£10.2m

Source: British Business Bank (2015). Aggregate jobs include full-time and part-time employees

Table 4: Changes in the formal and informal equity finance ecosystem spanning seed to later stages investment, 2007/8 to 2012/13

Equity Finance Stage	2007/08 – funding range:	2012/13 – funding range:
Later stage/ MBO/MBI	AIM IPO Corporate VC (£10m+)	AIM IPO Corporate VC (10m+, some earlier stage Pharma investments) Business Growth Fund (£2-10m) Institutional VC (£1m to 20m) VCT (£1m to £25m)
Early/mid stage	Institutional VC (£100k to £10m) VCT (£1m to £10m+) Hybrid public VC, including ECFs (£250k to £2m)	Hybrid public VC, including ECFs (£50k to £2m , some exceptions to £5m+) ACF (£200k to £2m) Angel network syndicates (£100k to £500k)
Seed/Start-up	Angel network syndicates (£25k up to £250k) HNWs (up to £100k)	Seed VCs, including ECFs (£50k to 500k) Angel Capital Groups (£25k to £100k) HNWs (up to £100k) Seed equity platforms (up to £100k) Accelerators (up to £50k)

Note: Bank debt finance is often included in the original model, but in practice has only been available to soft start-ups with consultancy income, or substantive business or founder collateral e.g. from a spin out, but these are now exceptions to the rule and few businesses with less than two years trading record will get any form of bank debt finance (GLA, 2013; North, Baldock and Ullah, 2013). Excludes grant funding e.g. from Innovate UK/Scottish Enterprise (Mason and Brown, 2013).