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ABSTRACT

The Post Crisis Growth in the Self-Employed: Volunteers or Reluctant Recruits?

In the UK by late 2014 there were almost 0.75m more self-employed than at the start of the financial crisis in early 2008. This represents over 75% of jobs growth in the UK over the same period. This experience has attracted commentary from independent policy analysts and others, focusing on whether growth has been structural, reflecting changes in the nature of employment and attitudes towards business venturing, or cyclical, reflecting a post-crisis shift towards flexible insecure forms of employment as an alternative to long-term unemployment. Recent commentary has also focused on heterogeneity across UK regions. Longitudinal data covering 2009-2013 from the ESRC Understanding Society survey are used to examine transitions into self-employment, and regression correlation with indicators of labour market conditions (unemployment, earnings) in the area local to the individual. Transitions into self-employment from both previous paid employment and inactivity found to be are negatively correlated with lagged local unemployment rates and positively correlated with lagged lower quartile earnings in the local area. These correlation patterns, although varying in size, hold for men and women, and are robust to controlling for individual characteristics. This suggests that local pull factors are far more significant in driving transitions into self-employment, and explains why business formation rates are higher, post-2008, in more advantaged UK areas. Self-employed business ownership does not appear to a significant alternative to unemployment for those where of paid employment demand is weak. Entrepreneurial activity prospers were wages are higher and unemployment lower.

JEL Classification: J21, M13, R23

Keywords: self-employment, local unemployment, local earnings, longitudinal analysis

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1. Introduction

In the UK by the end of 2014 there were almost three quarters of a million more self-employed in the workforce than at the start of the global financial crisis in early 2008. This is a remarkable numerical growth and represents in turn over three quarters of the total net growth in jobs in the UK over the same period (Table 1). The UK experience, although dramatic, is not unique across Europe. High rates of growth of self-employment have been observed in some of the eastern European accession states and to a lesser extent in France and the Netherlands. Nevertheless, across the EU as a whole self-employment has fallen slightly over this period. The UK experience has recently attracted commentary from independent policy analysts as well as concerned organizations such as trades unions (D'Arcy and Gardiner, 2014; Hatfield, 2015; Centre for Cities, 2015). Discussion has focused on the extent to which the growth has been structural, reflecting social changes in the nature of employment and attitudes towards business venturing, cyclical, reflecting a post-crisis shift towards flexible part-time forms of employment as an alternative to long-term unemployment, or spatial, reflecting geographical variation in supply- and demand-side influences. The present paper is concerned with the last of these.

Although self-employment has risen across all regions and devolved territories of the UK, with the exception of Northern Ireland, the scale of that growth has varied. In some regions, notably in London and the south east of England self-employment growth has been matched by growth in employee jobs; in others, notably in the north of the UK, it has not. All of this recent experience may sit uneasily with the change in research focus over recent years towards viewing entrepreneurial choice as driven by innovation and knowledge spillovers. To paraphrase an infamous question from an earlier debate about the depression crisis of the

1930s, is the army of the self-employed standing watch over the current fragile recovery from financial crisis a volunteer one or not?[1] Are those choosing self-employment reluctantly doing so in places where the alternatives are not very attractive, or making active choices in places where business start-up opportunities look more attractive?

The debate between viewing self-employment as opportunity-driven or necessity-driven (in the terminology of the Global Entrepreneurship Monitor) is of course not a new one. It has attracted significant research attention in the past (for example Gilad and Levine, 1986; Amit, 1994; Hessels et al., 2008; Thurik et al., 2008; Dawson et al., 2014). By and large past research has pointed towards the dominance of opportunity as a macro-level driving force. The vast majority of the self-employed appear to report opportunity-related or personal independence-related motives for their choice of economic status, and not to attribute any significance to "recession-push" factors. This points towards some coincidence between self-employment trends and entrepreneurial activity, broadly defined. However detailed micro-econometric analysis, which will be discussed further below, also points to the suggestion that those who form new self-employed business ventures from prior unemployment may not achieve the same levels of growth or business longevity as others.

It is therefore important to know more about the (newly) self-employed in post-crisis "austerity" United Kingdom. To what extent is variability in local labour market conditions and the state of local demand associated with individual transition into self-employment (stocks and inflows)? And therefore, perhaps more speculatively, what are the implications of this for the way in which policy to support entrepreneurship framed?

[1] The debate in question revolved around the relationship between unemployment and the level of unemployment insurance (Benjamin and Kochin, 1979).

In order to understand the dynamics of self-employment at the level of the individual, it is essential to analyze longitudinal data, rather than successive surveys drawn from different samples of the same population. This paper investigates individual-level microdata from the first four waves (2009-2013) of Understanding Society, the UK's principal household longitudinal survey, and undertakes data linkage to Office for National Statistics information on earnings and unemployment for 380 Great Britain local authority districts. It analyses the extent to which self-employment status and transitions (from paid employment and from inactivity) into self-employment are associated with variation in prior local economic conditions captured by unemployment rates and levels of earnings.

The paper concludes that there is little or no evidence for any net "push" effect into self-employment from weak local labour market conditions. The data are consistent with the net effect being one of "pull" in which improved local labour market conditions indicate better local business opportunities and market demand from higher spending power. "Pull" effects appear to be stronger for women and stronger still for those considering a transition into self-employment from inactivity.

The remainder of the paper is structured as follows. Section 2 provides a fuller background discussion, and review of both relevant academic literature and recent policy-focused commentary. Section 3 describes the data used and the main methods of analysis. Section 4 explains the results. Section 5 provides a discussion and commentary on these findings and their implications. Section 6 is a final conclusion and comment on policy implications.

2. Regional drivers of self-employment

Self-employment currently accounts for over 15% of all those in work in the UK, or over four and half million individuals from a workforce of almost 31 million. To set this in context, steady growth in self-employment has been a pronounced feature of the development of the UK labour market for some considerable time. As Figure 1 shows, 35 years previously in 1979 the rate of self-employment was exactly half the rate in mid 2014. Growth over that period has not been uniform: the period of high unemployment in the 1980s witnessed more rapid growth, with some decline in the rate during the period of sustained economic growth through the 1990s. The self-employment rate started to grow more rapidly again from around 2008 onwards, coinciding with the onset of the global financial crisis. Figure 2 charts movements in UK unemployment totals since 2000 quarter by quarter, alongside the total numbers of self-employed. It is difficult to draw any firm conclusion from the superimposition of these two time series – it does not suggestion any strong pro- or counter-cyclical trend.

The post-crisis development of the UK economy has been notable in that total numbers in work has maintained sustained growth, with no dramatic growth in unemployment that characterized earlier recessions in the UK, notably in the 1930s and 1980s. Table 1, drawn from official UK ONS statistics, describes the creation of jobs in the UK between 2008 and 2014 and shows clearly how this net growth in jobs is significantly accounted for by the growth in self-employment. Of 920,000 net new jobs created between quarter 1 of 2008 and quarter 2 of 2014, 693,000 were in self-employment. The net figure represents a balance of inflows and outflows. Inflows account for over 36% of the total in self-employment five years previously; outflows represent only 23% of those in self-

employment five years previously. This amounts to a significant growth in either small-scale business venturing or freelancing/own-account self-employment or both (and at a time when UK tax authorities have progressively tightened rules of self-employment registration, HMRC (2013)). Table 1 also reports, for comparison purposes, data showing the change in the population of micro businesses (0-10 employees) in the UK over the same period. Data include businesses which are registered for VAT and, if employers, for making tax and national insurance payments (pay-as-you-earn, PAYE) on behalf of employees, as well as unregistered sole-traders. Although the increase of over 290,000 net new businesses is not on the same scale as for self-employment, it is still significant. D'Arcy and Gardiner (2014) provide comparative information on recent trends in these two measures. The difference in the data suggests a number of possibilities, including significant growth in non-business ownership self-employment, or the transitioning into full-time self-employment by individuals who had already registered businesses or were joining businesses already established by other self-employment individuals.

Growth in self-employment has been proportionately higher amongst women over the period 2009 to 2014. In fact UK Labour Force Survey estimates suggest that growth in female self-employment accounted for almost half of the total growth, even though in 2014 men still account for 68% of all self-employed.

The regional pattern in the growth of self-employment has not been uniform across the UK. Table 2 describes the patterns at the high level of government office region (NUTS1). Self-employment has grown significantly in all regions and devolved territories

with the exception of Northern Ireland.[2] One might hypothesize that either self-employment growth would be highest in the fastest growing regions closest to and including London, or that self-employment growth might have been stronger in the weaker regions most at risk from job losses following the financial crisis. In the data three groups of not necessarily contiguous regions emerge. In London, the South East, the West Midlands and the North West self-employment has grown between 17 and 19% over the period 2008 to 2013. In the North East, the East, the South West and in Wales the growth rate has between 10 and 12%. In Scotland, Yorkshire and Humberside and the East Midlands growth has been around 7 to 8%. It is difficult to make particular sense of these groups – except to propose that self-employment growth in particular regions appears to reflect a complex balance of economic demand and labour market pressures, and, to the extent that devolved territories are free to adopt different policy instruments, variation in policy activism. Nevertheless, in terms of absolute numbers, the growth in self-employment is dominated by growth in London, the South East and the North West.

Ex ante the theoretical relationship between entrepreneurial activity and unemployment is ambiguous. Economic analysis of entrepreneurial choice predicts that higher unemployment will induce more to switch into self-employment because increasing unemployment raises the differential between the expected return from using one's human capital in business ownership and that expected from attempting to deploy that human capital in the paid labour market (Parker, 2009). However, the regional economics literature argues that entrepreneurial opportunities are less prevalent in localities where unemployment is

[2] The Northern Ireland experience has been somewhat different to that of the rest of the UK, largely because levels of self-employment have historically been much higher in the province due to greater significance of agriculture and related rural sectors to its regional economy. Since the 1998 Good Friday Agreement the region has experienced a significant measure of economic stability that has supported inward investment, industrial restructuring and growth of new sectors, and employment growth.

higher, because higher unemployment correlates with lower economic demand and therefore business opportunity (Storey, 1991; Reynolds et al., 1994). The question of the relative importance of "prosperity-pull" and "recession-push" effects is one that dominates extant research on the relationship between entrepreneurial activity and unemployment, and figures significantly in discussion on the spatial variation in self-employment and new firm formation (see Audretsch et al, 2014).[3] It has been noted on many occasions that there is no clear-cut empirical relationship here, reflecting the theoretical ambiguity (Armington and Acs, 2002; Thurik et al., 2008; Parker, 2009; Audretsch et al., 2014).

Self-employment growth may reflect "necessity" motives, as unemployed workers in times and in locations of weaker labour demand, turn to entrepreneurship as an alternative source of earnings. Thus, governments may pursue active labour market policies that encourage and support business venturing as a means of alleviating unemployment (Frisch, 1993; Baumgartner and Caliendo, 2008; Caliendo and Kunn, 2014). New business owners may find it easier to hire other employees when unemployment is higher, reinforcing the higher unemployment-higher entrepreneurial activity argument (Henley, 2005). On the other hand self-employment growth may reflect wider improvements in economic demand for goods and services at particular times and locations. The payment of redundancy compensation may also encourage transition into self-employment by the unemployed because windfall payments may provide a ready source of business capital (Lindh and Ohllson, 1996; Taylor, 2001; Hurst and Lusardi, 2004; Georgellis et al., 2005).

Parker (2009) notes that early cross section evidence tends to support the conclusion of a negative association ("prosperity-pull") between local unemployment rates and the

[3] Audretsch et al. (2014), Table 1, provides a helpful summary of previous empirical research.

probability that an individual would be in self-employment. However more recent research appears to question that conclusion (see Parker, 2009, Table 4.1, p. 108 for a meta-analysis). Instead it squares with the observation of Evans and Leighton (1990) that a higher proportion of the unemployed, when compared to the already employed, appear to transition into self-employment. Research on the strength of the association between unemployment and new firm formation reinforces this ambiguity, but does find clear evidence of a positive association between business venturing and local economic prosperity (Frisch and Storey, 2014).

At least one recent micro-econometric analysis, in this case for older Americans, supports the finding that the unemployed are more likely to enter self-employment (Biehl et al., 2014). This recent study serves to reinforce an important point – namely that much previous research has focused on the relationship between unemployment and the size of the self-employed "stock". Given that choices, particular business investment decisions, may be subject to inertia, it is more important to focus on transitions into self-employment. Observed status may be associated with driving factors at some variable point in the past depending on the length of any current self-employment spell. Cross-sectional correlations between levels of self-employment and local unemployment rates may not reveal much at all about past drivers. Transition decisions are more likely to be influenced by observed conditions immediately preceding the decision.

An investigation of transitions (flows) rather than self-employment status (stocks) normally requires longitudinal data. Furthermore longitudinal data may allow entrepreneurial choice to be more accurately defined and modelled (Frisch and Storey, 2014). However, even within longitudinal data sources such as household panel surveys the sample numbers

transitioning into self-employment may be quite small, particularly for those transitioning from unemployment, making it difficult to identify strong associations with particular driver factors. Longitudinal data also allows the implications of entering self-employment from prior unemployment to be investigated. Survival rates (spell lengths) in self-employment may be lower (Millán et al., 2012). Businesses started by the unemployed may also not grow as quickly (Hinz and Jungbauer-Gans, 1999; Caliendo and Kunn, 2014).

Time series analyses measuring the strength of any association between self-employment and unemployment aggregates, either at economy-level or large regional-level, provide contrast in methodological terms with these cross-sectional and longitudinal individual-level analysis. An authoritative study is Thurik et al. (2008) which concludes with evidence for both push and pull effects, but that the "prosperity-pull" hypothesis is much more significant in quantitative terms. Other regional panel work also provides support for some degree of "recession-push" impact on self-employment rates (Robson, 1998; Parker and Robson, 2004; Nittykangas and Tervo, 2005; Tervo, 2006). There may be a similar impact on regional new firm formation rates (Ritsilä and Tervo, 2002).

Theoretical ambiguity exists both between and within the notions of "prosperity-pull" and "recession-push". In essence behind the "recession-push" hypothesis are two further two ideas. The first is that higher numbers of unemployed in a locality may result in a greater likelihood that those entering self-employment do so from unemployment, and that this likelihood increases further because paid-employment job search is more difficult and costly. The second is that higher local unemployment is associated with generally more difficult local labour market conditions. In the context of the aftermath of the 2008 crisis in the UK, that meant for most workers very low rates of anticipated nominal wage growth (and real

wage declines), and for some, where employers were able to negotiate pay cuts in order to preserve jobs, very significant nominal and real declines in earnings (Gregg et al., 2014). Furthermore, perceived job security may have fallen sharply, and, under pressure from employers to restore falling productivity levels, job satisfaction may have fallen as well (McManus, 2012, commenting on trends in the British Social Attitudes Survey). All of these pressures may serve to raise the perceived relative attractiveness of self-employment. Of course, in reality, actual self-employment may also turn out to be unrewarding, unsatisfying and insecure (D'Arcy and Gardiner, 2014; Hatfield, 2015).

Audretsch et al. (2014) make an important observation that current local unemployment rates mask heterogeneity about local labour market conditions, in particular the extent to which local variation in the skill levels of the unemployed, as well as variation in spell duration, reveals information about their ability to compete for available jobs, and therefore experience lower "push" towards self-employment. Recent post-crisis UK labour market experience has been notable because unemployment rates have not risen as far and as fast as in previous periods of recession or as in other larger European economies, and therefore led to significant unemployment duration dependency. What has been noticeable has been the sustained experience of stubbornly low rates of wage growth across the UK, but particularly in lagging regions (Gregg et al., 2014). This may have had far more impact on both tipping the balance between the relative attractiveness of self-employment versus paid employment, and on the level of local demand for the products and services of new business ventures. It reinforces the suggestion that local unemployment rates may not convey full information about local economic factors.

One further key theme in the literature is the differing self-employment context for men and women (Brush, 1992; Hughes, 2003). In the UK in 2014 the male self-employment rate was 19% of the economically active, whereas the rate for women was only 10%. However female self-employment grew over the previous ten years by 53%, compared to a growth rate of 16% for men (computed from UK Labour Force Survey estimates). Recent research also strongly suggests that motivating factors, influencing choice, are different between the two (Dawson et al., 2014), although whether people individuals give objective responses to recall questions about why they chose self-employment at some time in the past is open to debate.

To summarise the discussion so far, this paper revisits the question of whether the likelihood that an individual will choose (transition into) self-employment is higher or lower if that individual lives in a locality where unemployment is higher. The paper also addresses the same question with reference to the level of wages in the locality. Importantly, in using a large-scale longitudinal microdata source, this analysis is conducted whilst controlling for variation in individual skill levels and other demographic factors. In particular the analysis focuses on whether the likelihood of self-employment is further affected by whether the individual was previously unemployed or inactive, and focuses on investigating potential differences between men and women.

3. Data and methodology

The remainder of the paper undertakes an empirical investigation of self-employment status choices and transitions using recent UK longitudinal data at the level of the individual, drawn from Understanding Society (USoc), the UK's household longitudinal survey. This survey both extends and embeds the former British Household Panel Survey (BHPS). BHPS, which was conducted prior to the establishment of USoc between 1991 to 2008, provided a core sample of 5000 households (with some subsequent regional sample boosts). USoc was initiated in 2009 with a sample target of 40,000 households drawn from a stratified, clustered sample of UK residential addresses (including a mainstage sample, former BHPS households and a new ethnic minority boost sample). The achieved wave 1 sample, collected over a two-year period 2009-2010 was 39,802 households, comprising 101,086 individuals across all ages of whom 27,103 were in employment or self-employment. Sample waves collected are on an annual frequency across two year overlapping periods, with 4 waves currently released to researchers, i.e. 2009-10, 2010-11, 2011-12 and 2012-13. Precise dates of interview are recorded. Buck and McFall (2012) provide further technical details of the survey design. In following a household design, the achieved Wave 1 sample has characteristics that are very similar to the UK government Labour Force Survey.

There is some sample attrition between waves due to loss of contact or refusal to remain a participant. Between Waves 1 and 2 approximately 20% of the sample was lost (Buck and McFall, 2011), however attrition rates in successive waves were much lower and in line with comparable longitudinal surveys, internationally. The inclusion of additional "temporary sample members" offsets attrition; these are recruited if they join originally sampled households.

Table 3 provides summary data on the scale of self-employment and transitions into self-employment in the sample. The overall rate of self-employment rises from 13.3% to 13.9% over the four available sample waves. In line with official UK government data (Labour Force Survey) the rate of self-employment is considerably higher for men than for women. However the rate of increase is higher for women. Not all the self-employed are business owners – some are able to register with the tax authorities as self-employed because they are sub-contractors, freelancing or working in some other form of non-business ownership self-employment. Self employed business owners (i.e. as sole owner or in partnership) comprise over three-quarters of the self-employed, in virtually identical proportions for men and women, and showing very similar rates of growth to overall self-employment.

The growth in the self-employment total is reflected in the growing numbers of transitions between waves into self-employment, both from previous paid employment and from previous inactivity (from unemployment or from withdrawal from the labour force for other reasons). A number of features stand out. The first is that the proportion of all transitions into business ownership is just below 70%, and therefore lower than the proportion of business owners in the self-employed stock as a whole. In other words there appears to be some growth in the scale of subcontracting and freelancing activity that is not connected to new business venturing. The second is that around half of all transitions into self-employment are from inactivity rather than paid employment. This suggests that significant numbers chose self-employment as an alternative to worklessness – however this could reflect both or either of a “necessity” motive arising from weak local labour market conditions and an “encouraged worker” effect arising from improving local economic

conditions. The third feature is that the growth in transitions over the four years is stronger for women than for men, and the proportion of women that transition from inactivity is higher than for men. However it is important to qualify these observations by noting that the absolute numbers of transitions observed in what begins as a very large sample are quite small, and therefore not necessarily a fully reliable guide to patterns in the overall population.

In order to address the question of the relationship between self-employment patterns and local economic conditions, Office for National Statistics (ONS) data on 380 local authority district unemployment rates and earnings levels are linked into the microdata files.[4] Earnings are measures at the lower quartile (25^{th} percentile) level, in order to reflect earnings towards to lower part of the distribution as an appropriate comparator for those in particular who may transition into self-employment from inactivity.[5] Bivariate correlation analysis of self-employment status and transitions with these local economic indicators is then conducted. Self-employment status and transitions into self-employment are then modelled in a probabilistic framework using binary dependent variable regression (probit) analysis. This allows for control for the mediating impact of demographic factors including age, gender, ethnicity, education and family background. Because the data are longitudinal, with multiple observations for each individual, it is possible to perform this analysis both using conventional regression pooling available data from the different waves, as well as using random effects modeling in which variation in time-invariant individual characteristics is incorporated within the regression error structure, though the assumption that the successive

[4] This required access to information on the local authority district of residence of each sample household in each wave, information that is not released in the public access data files for Understanding Society. The author is grateful to the UK Data Service and the University of Essex for granting permission to access this information. The ONS data are extracted using the ONS NomisWeb service, and relate to Great Britain. Northern Ireland is excluded from the analysis because its data are collected on a different basis and not available through ONS.
[5] In fact it makes little difference to the results if the local median level of earnings is used.

correlation of error terms for a particular sample individual is constant over time (Guilkey and Murphy, 1993; Arulampalam, 1999).

The regression structure to model the probability for individual *i* at time *t* of (transition into) self-employment, S_{it}, conditional of a set of covariates $\boldsymbol{x}$ including the local unemployment rate and local earnings in the previous year, takes the following form:

$$\Pr(S_{it} \neq 0 | \boldsymbol{x}_{it}) = \Phi(\boldsymbol{x_{it}\beta} + v_{it}) \tag{1}$$

where $v_{it} = \alpha_i + u_{it}$ in the case of the random effects estimation method, and $v_{it} = u_{it}$ in the case of the "conventional" (pooled) probit method (although reported estimates include standard errors which are corrected for clustering by multiple observations on each individual sample member). The explanatory power of the random effects form versus the conventional pooled form is usually described in the calculation of ρ, the proportion of the total error variance contributed by the panel level error variance σ_α^2, defined as $\rho = \frac{\sigma_\alpha^2}{\sigma_\alpha^2+1}$, since $\sigma_v^2 = 1$ by construction. Model estimation was performed using Stata version 14. Because, in the case of the random effects model, the likelihood function is not defined analytically, the estimation method uses a Gauss-Hermite quadrature numerical approximation method.

Alongside indicators of conditions in the local economy (unemployment, earnings) the vector of covariates includes a range of other factors commonly used in studies of self-employment or entrepreneurship choice (Dunn and Holtz-Eakin, 2000; Taylor, 2001; Georgellis et al., 2005; Niittykangas and Tervo, 2005; Colombier and Masclet, 2008; Parker 2009). These include gender, age, level of educational attainment, ethnicity, entrepreneurial parentage and rural/urban location, as well as high level (EU NUTS 1) regional indicators and time controls to capture any aggregate economic cycle impact.

4. Findings

a) Correlation analysis

Table 4 reports bivariate correlations and the significance levels of two-sample t-tests comparing mean values of local unemployment rates and local median gross weekly earnings for the self-employed (transitioners) and others. Results are reported for all, and for men and women separately. All of these are correlations are small; however in many cases the differences between the groups are statistically significant. The first row of the table shows that self-employment is statistically significantly lower in localities of higher unemployment. The finding holds for both men and women. For earnings the picture is more complex. Although across the full sample self-employment is higher in localities with higher (lower quartile) earnings, for men there is a weak but statistically significant negative association. Further down in the fifth row of the table, similar correlation patterns for self-employed business owner are found, particular for unemployment. However, self-employed business ownership is statistically significantly lower where lower quartile earnings are higher for both men and for women. But across the combined sample, levels of self-employment would appear to be depressed in localities where the local labour market is weaker, and encouraged where local spending power (earnings) are higher. Weak negative, but significant separate correlations for men and women may suggest that lower levels of pay in the lower part of the paid employment market do raise the attractiveness of "going it alone".

The second and sixth rows of the Table 4 report associations between transitions into self-employment/business ownership and local unemployment and earnings. Higher local unemployment is associated with slightly lower transitions; higher local earnings are

associated with higher transitions. These associations, although statistically significant, are small in size. They suggest that the net impact of improving local economic prosperity is one of "prosperity-pull". Any strong effect that might push individuals, who are finding it difficult to find satisfactory local employment, into choosing self-employment is absent in the data. This is further confirmed by separating transitions into those that are from paid employment and those from inactivity. There is no indication here of a strong "push" effect from inactivity into self-employment. For men, the negative association between self-employment transitions and local unemployment disappears. For women, it is stronger. Women appear more likely to be attracted into self-employment if local conditions improve.

Finally the bottom row of the table exploits information from an additional question asked of 16 to 21 year olds, concerning likelihood of being self-employed in the future.[6] This variable appears to correlate positively and statistically significantly with both local unemployment rates and local earnings for young men. An earnings correlation, but not an unemployment correlation, is found for women. This suggests that higher unemployment in the locality may serve to encourage ideas about business start-up. One the other hand the size of the correlation coefficient is much higher for earnings and is significant for young men and women, suggesting that any "recession-push" motive is more than offset by the "pull" effect created by a vibrant locality.

[6] The question (what is the probability, between 0 and 100%, that you will be self-employed in the future) was asked in Waves 2 and 3 only. Respondents were asked to indicate perceived probability ranging from zero to 100%. The mean stated probability was 34% from 8692 available responses.

b) Multivariate regression analysis

The results in Table 4 are inconclusive on whether local unemployment rates and local earning levels contribute the same or different information about the local attractiveness of self-employment. This argues in favour of paying attention to the results from multivariate analysis. Table 5 reports probit regression analysis for self-employed status, whilst table 6 reports a similar analysis for transitions into self-employment.

In Table 5 three different model specifications are reported. Columns 1 and 2 report conventional probit models, although standard errors are adjusted to account for clustering because the data structure entails multiple observations for the same individual. Column 1 includes high level regional binary variables and binary variables for time period of observation, defined on six-monthly intervals. Column 2 excludes these. Column 3 reports the results of a random effects probit estimation, as described in equation (1) above. The high estimated value of ρ suggests strongly that the random effects formulation is the preferred model.

In all three models there is a significant negative association between the local area unemployment rate and the probability that an individual will be in self-employment. In the first model, where there are additional controls for time and high-level regions, the coefficient size is small, although statistically significant (the estimated marginal effect is such that a 1 percentage point increase in the unemployment rate is associated with a fall in the probability of self-employment of 0.002). Suppression of time and regional controls doubles this size of this association. These results point to a net effect from local unemployment, which is consistent with opportunity or "pull" effects being stronger than any

"push" effect from unemployment into self-employment, even after controlling for the impact of variation in local earnings capacity. The association between self-employment and local earnings levels is not as consistent in the estimates. In the first column lower earnings are associated with higher self-employment, and the effect is statistically significant. However suppression of time and regional controls cause the association to change sign and lose statistical significance. In column 3 the association between self-employment and local earnings becomes strongly positive and statistically significant. This again is consistent with opportunity effects being stronger than any "push" effects into self-employment from poor local labour market conditions.

The other control effects reveal a number of demographic associations. Consistent with the descriptive statistics, women are significantly less likely to be self-employed. Older individuals are more likely to be self-employed. There is a mixed pattern of associations with ethnicity: white non-British, Asian and Chinese/East Asian groups tend to be more likely to choose self-employment, other things equal, compared to white British individuals. On the other hand in the conventional probit equations African-Caribbean groups are less likely to be in self-employment. Self-employment probabilities are lower if an individual's highest level of educational attainment was a vocational qualification, but other educational effects are not significant. Having a father who was a business owner when you were 14 years of age is significantly associated with a higher probability of self-employment; although no similar effect is observed for mother's occupational status. Finally individuals who are resident in rural areas are, other things equal, significantly more likely to be in self-employment.

In Table 6 a spread of seven different specifications are presented for year-on-year transitions into self-employment, exploring both the difference in model estimation method

and interactions of the local labour market variables with gender and an individual's prior economic status (activity or inactivity). Columns 1 to 3 duplicate those in Table 5. Once again the relationship with local unemployment is a statistically significant negative one. The individual probability of transition into self-employment falls if the local unemployment rate is higher. Marginal effects are small. A one-percentage point increase in unemployment is associated with a drop in the probability of transition into self-employment of between 0.0004 and 0.0005 (from its mean of 0.014). For local earnings, in columns 2 and 3 with no higher-level regional controls, the association with the probability of self-employment transition is a positive and significant one. Again, although the effect is statistically significant, the marginal effects are small (0.002 for a £100 increase in lower quartile weekly earnings in column 3). The emerging picture is the same in both tables: evidence for slightly weaker but statistically significant opportunity effects from worsening local economic vibrancy.

In columns 4 and 5 unemployment and earnings are interacted with gender to investigate differences in these associations between men and women. The overall picture is that opportunity or "pull" associations between self-employment transitions and local labour market conditions are much stronger for women than for men. This appears to the case for both local unemployment rates and earnings levels. In the random effects model the female self-employment transition rate marginal effect is 0.0013 for each percentage point fall in unemployment, around three times as large as the combined gender estimate. For earnings the marginal effect is twice as large at 0.004.

Column 6 includes further interaction effects to investigate differences between the probabilities of transition from activity or inactivity. Unemployment and earnings gender

interactions are further interacted with a binary variable identifying those who were inactive in the previous year of the survey. The coefficients on these additional interactions should therefore be interpreted as the additional impact of local labour market conditions for a previously inactive individual compared to one who was in paid employment. For local unemployment these interactions are negative and statistically significant, for both men and women. The opportunity-damaging effect of rising unemployment is stronger for those considering self-employment from inactivity compared to those considering a switch from paid employment. The same effect is also found for local earnings. Lower earnings reduce transition probabilities further for those switching from inactivity compared to those from paid employment.

The estimated values of ρ for the random effects models in Table 6 are around 0.1 in each case. Although much lower than in Table 5, these estimates are all around twice as large as their estimated standard errors, and therefore still showing that random effects formulations are the preferred models.

Finally column 7 in Table 6 includes interactions of the local unemployment rate with the individual's self-reported length of economic inactivity (in years), constructed from USoc employment history recall questionnaire schedules.[7] In the case of those who are in employment rather than inactive this number is set to zero. The purpose of this is to investigate the finding recently reported by Audretsch et al. (2014) that it is long-term unemployment rather than unemployment *per se* that has an adverse impact on new firm formation. The results reported are for a pooled probit estimation because in this case the

[7] The sample size drops because around 20% of individuals in the sample have item non-response in the USoc employment history schedules.

error component correlation is not significantly different from zero.[8] There are two features of these results. The first is that the interaction with the length of time spent inactive attracts statistically significant coefficient estimates for both men and women. Computed marginal effects imply that an additional year of inactivity lowers the probability of transition to self-employment by 0.02% (and by slightly more for men). The second feature is that controlling for inactivity duration increases the size and significance (to a level of 7%) of the positive association between the unemployment rate and the probability of transition for men. This suggests that there may be a slight net "push" effect into self-employment for men who are only recently unemployed, supporting the finding in Audretsch et al. (2014).

Turning to the other covariate coefficient estimates in Table 6, these show both similarities and differences in demographics associations with those in Table 5. The similarities are as follows. Women are less likely to transition into self-employment (a marginal effect of around 0.01 and therefore quantitatively significant given the sample mean transition probability of 0.014). The pattern of differences across ethnic groups broadly holds across the pattern of coefficients from status to transition probabilities, with White non-British and Other ethnic groups significantly more likely to transition into self-employment. Other coefficient estimates, although carrying the same signs as in Table 5, are not statistically significant. Having a business owner father increases the transition probability and those in rural areas are more likely to transition to self-employment. The key differences are for age and education. Older individuals are significantly less likely to transition into self-employment even though they are more likely to be found in self-employment. Educational effects are relative to the reference group of those with below age 16 or no educational qualifications. Both university/college graduates and those with age 16 school leaving

[8] Consequently the unreported random effects coefficient estimates are very close to those reported.

qualifications are more likely to transition into self-employment. Groups with intermediate level qualifications are not less likely. The coefficient for vocational qualifications, which was negative and significant in Table 5, usually remains negative in the models for transitions but is not significant. These results are consistent with self-employment being attractive to a) those with both professional occupational skills and b) those who venture business activity that does not require high levels of formal educational attainment in pursuit of returns higher than those available in the paid labour market.

5. Discussion

The main finding to emerge from this analysis is that local economic and labour market conditions appear to exert a largely positive influence on the likelihood of choosing self-employment. In other words, improving local unemployment and earnings (in the lower part of the earnings distribution) are positively associated with the probability that an individual will choose self-employment (Table 5) or choose to transition into self-employment (Table 6). There is little or no suggestion of any net "recession-push" effect on self-employment. It was noted earlier that the extant cross-sectional literature has proved to be agnostic on the key question of a positive or negative association between self-employment and unemployment (Parker 2009). However, this paper finds, even during the difficult economic conditions in the immediate aftermath of the 2007-8 global financial crisis, rather stronger evidence for a local demand "pull" effect. This stands in stark contrast to the weight of evidence in time-series analyses for recession-push effects (Parker 2009). If there is any "push" influence of rising unemployment or falling paid employment earnings into self-employment, for most individuals it is more than offset by the opportunity-damaging effects that rising local unemployment or falling wages have on the attractiveness of a locality as a

place in which to do business. The scale of the associations is stronger for those who are considering transition into self-employment from economic inactivity, and suggests that entrepreneurial labour force participation decisions are influenced by the expected returns from business venturing. Women, in particular, seem to be encouraged to switch from labour force withdrawal into business venturing activity by improvements in the local economy.

The only evidence found for the "push" hypothesis in the analysis is for men, particularly those considering transitioning from (poorly) paid employment or from a relatively short period of inactivity, or unemployment. This evidence is statistically quite weak. However, the longer someone has been unemployed *and* the higher the local unemployment rate, then the less likely that person is to transition into self-employment, offering further support for Audretsch et al. (2014), from a different type of data source.

In summary, it is difficult to conclude from this analysis that there is really much evidence for a "push" effect of rising unemployment into self-employment and small scale business venturing. It cannot be ruled out that both "push" and "pull" effects are large but offset each other to the extent that the net association is small. A "push" effect may exist in the minds of those considering self-employment. However any such effect is very significantly offset by the negative "opportunity" effect. Higher local unemployment and lower local earnings levels signal that the potential gains from business venturing have worsened. Alternatively falling unemployment and rising wages encourage business venturing, rather than encourage the self-employed to switch out of self-employment into better paying and less risky waged employment.

Current UK policy in this area is focused on the provision the "new enterprise allowance" which provides up to 26 weeks of income support as well as access to some start-up loan capital, targeted in particular at the inactive and unemployed.[9] Whilst policies of this nature may support the unemployed to take advantage of entrepreneurial opportunities, the paradox in the results here is that this may have more impact in leading regions rather than in lagging ones, where local unemployment rates are lower and earnings at the lower end of the distribution are higher. In turn this may, at the margin, worsen rather than lessen regional inequalities.

Although these results fail to identify any net recession-push effect for self-employment transitions, in Table 4 a positive correlation between local unemployment and young men's reported likelihood of future self-employment was reported. Local unemployment may stimulate interest in self-employment even if actual transitions do not occur, particularly for men. This is investigated further in a similar regression analysis reported in Table 7. These results do suggest a weakly significant positive association between the local unemployment rate and the probability that a 16 to 21 year old male attaches to future self-employment. For young women any local labour market effect seems to focus more on opportunity, as indicated by the positive earnings coefficient.[10]

The present study has also attempted to highlight the potential value of large-scale longitudinal survey data for research on entrepreneurship and self-employment. In particular the analysis focuses on transitions into self-employment, rather than the self-employment

[9] See https://www.gov.uk/new-enterprise-allowance (accessed 15 June 2015) for further details.

[10] Two other features stand out in Table 7. The first is that interest in self-employment, even within a small age range sample, falls with age. The second is that young African-Caribbean and other ethnic groups have higher interest in self-employment, even though for the first of these there is no evidence of association with higher transition rates in Table 6.

status. This is important because the former are far more likely to be influenced by recent movements in local economic conditions, whereas the latter may reflect individual decisions made initially at a time of very different economic circumstances and subsequently affected by inertia and accumulated experience. Nevertheless large-scale quantitative analysis is not without its limitations – in particular it lacks the ability to address in a more nuanced manner the underlying causal processes that may lead an individual to reflect on local economic circumstances when assessing the range of specific opportunities and choices which that individual may face at a given point in time and place.

6. Conclusions

Structural growth in self-employment in the UK began well before the onset of the global financial crisis, but has continued at a significant pace since, accounting for a very significant proportion of recent UK jobs growth. In the terms of the question posed in the title to this paper, the analysis presented in this paper suggests, despite some significant recent commentary, that this is the outcome of voluntary choices made by individuals who in part respond to local signals about economic opportunity. The self-employed do not appear to be reluctant converts to entrepreneurship, "encouraged" into business start-up activity by the absence of (well paid) local jobs. This paper has investigated the strength of any association of local unemployment rates and local lower quartile earnings with self-employment status and the likelihood of individual transition into self-employment. Associations, while in some cases, statistically significant, are not quantitatively strong. Opportunity-pull effects appear to be stronger for women than for men. Nevertheless these findings do offer some insight into why self-employment growth has been strongest in regions where unemployment is lower,

earnings are higher and therefore economic conditions for entrepreneurial opportunity more favourable. The continued growth in self-employment appears to be structural rather than cyclical in the sense that it is likely to be driven by longer terms movements in perceptions of entrepreneurship and availability of resources and skills to support those choosing self-employed business ownership as a career move. Policies to support the unemployed into entrepreneurship may exacerbate rather than alleviate regional inequalities, because they may have more impact in fast growing localities rather than lagging ones. In lagging ones, start-up support for the unemployed and inactive may offer cold comfort if local demand conditions remain weak. Regional policy to stimulate demand for the outputs of new businesses, rather than encourage supply of entrepreneurial labour, is likely to be much more effective in raising entrepreneurial activity.

References

Amit R. (1994), "'Push' and 'pull' entrepreneurship", in Bygrave W. D., Birley S., Churchill N. C., Gatewood E., Hoy F., Keeley R. H. and Wetzel, Jr W. E. (Eds) *Frontiers in Entrepreneurship Research 1994*. Proceedings of the 14th Annual Entrepreneurship Research Conference, Babson College, Wellesley, MA (available at: http://fusionmx.babson.edu/entrep/fer/papers94/index.html).

Armington, C. and Acs, Z. (2002), "The determinants of regional variation in new firm formation", *Regional Studies* 36: 33-45.

Arumlampalam, W. (1999), "A note on the estimate effects in random effects probit models", *Oxford Bulletin of Economics and Statistics*, 61: 597-602.

Audretsch, D.B., Dohse, D. and Niebuhr, A. (2014), "Regional unemployment structure and new firm formation", *Kiel Working Paper* No. 1924, Kiel: Institute for the World Economy.

Baumgartner, H.J. and Caliendo, M. (2008), "Turning unemployment into self-employment: effectiveness of two start-up programmes", *Oxford Bulletin of Economics and Statistics*, 70(3): 347-373.

Biehl, A.M., Gurley-Calvez, T. and Hill, B. (2014), "Self-employment of older Americans: do recessions matter?", Small Business Economics, 42: 297-309.

Benjamin, D. and Kochin, L. (1979), "Searching for an explanation of unemployment in Interwar Britain", *Journal of Political Economy*, 87(3): 441-478.

Brush, C.G. (1992), "Research on women business owners: past trends, a new perspective and future directions", *Entrepreneurship Theory and Practice*, 16(4): 5-30

Buck, N. and McFall, S. (2012), "*Understanding Society*: design overview", *Longitudinal and Life Course Studies*, 3(1); 5-17.

Caliendo, M. and Kunn, S. (2014), "Regional effect heterogeneity of start-up subsidies for the unemployed", *Regional Studies*, 48(6): 1108-1134.

Centre for Cities (2015), *Cities Outlook 2015*, London: Centre for Cities (January).

Clark, K and Drinkwater, S (2000), "Pushed out or pulled in? Self-employment among ethnic minorities in England and Wales", *Labour Economics*, 7: 603-628.

Colombier, N. and Masclet, D. (2008), "Intergenerational correlation in self-employment: some further evidence from French ECHP data", *Small Business Economics*, 30: 423-437.

D'Arcy, C. and Gardiner, K. (2014), *Just the Job – Or a Working Compromise? The Changing Nature of Self-Employment in the UK*, London: Resolution Foundation (May).

Dawson, C., Henley, A. and Latreille, P. (2014), "Individual motives for choosing self-employment in the UK: does region matter?" *Regional Studies* 48(5): 804-822.

Dunn, T. and Holtz-Eakin, D. (2000), "Financial capital, human capital and the transition to self-employment: evidence from intergenerational links", *Journal of Labor Economics*, 18: 282-305.

Evans, D.S. and Leighton, L.S. (1990), "Small business formation by unemployed and employed workers", *Small Business Economics*, 2(4): 319-30.

Frisch, M. (1993), "Regional differences in new firm formation: evidence from West Germany", *Regional Studies*, 26(3): 233-241.

Frisch, M. and Storey, D.J, (2014), "Entrepreneurship in a regional context: historical roots, recent developments and future challenges", *Regional Studies*, 48(6): 939-954.

Georgellis, Y., Sessions, J.G. and Tsitsianis, N. (2005), "Windfalls, wealth and the transition to self-employment", *Small Business Economics*, 25: 407-25.

Gilad B. and Levine P. (1986), "A behavioral model of entrepreneurial supply", *Journal of Small Business Management* 24(4), 45–53.

Gregg, P., Machin, S. and Fernández-Salgado, M. (2014), "The squeeze on real wages – and what might it take to end it", *National Institute Economic Review*: 228(1): R3-R16.

Guilkey, D. K., and J. L. Murphy (1993), "Estimation and testing in the random effects probit model", *Journal of Econometrics*, 59: 301–317.

Hatfield, I. (2015), *Self-Employment in Europe*, London: Institute for Public Policy Research.

HM Revenue and Customs (HMRC) (2013), *Onshore Employment Intermediaries: False Self-Employment*: Consultation Document URL: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/264649/Onshore_employment_intermediaries_-_false_self_employment.pdf (accessed 16-1-15).

Henley, A. (2005), "Job creation by the self-employed: the roles of entrepreneurial and financial capital", *Small Business Economics*, 25: 175-196.

Hessels, J., van Gelderen, M. and Thurik, A.R. (2008), "Entrepreneurial aspirations, motivations and their drivers", *Small Business Economics*, 31(3): 323-39.

Hinz, T. and Jungbauer-Ganz, M. (1999), "Starting a business after unemployment: characteristics and chances of success (empirical evidence from a regional German labour market, *Entrepreneurship and Regional Development*, 11: 317-333.

Hughes, K. (2003), "Pushed or pulled? Women's entry into self-employment and small business ownership", *Gender, Work and Organization*, 10: 433-454.

Hurst, E. and Lusardi, A. (2004), "Liquidity constraints, household wealth and entrepreneurship", *Journal of Political Economy*, 112: 319-47.

Lindh, T. and Ohlsson, H. (1996), "Self-employment and windfall gains: evidence from the Swedish lottery", *Economic Journal*, 106: 1515-26.

McManus, S. (2012), "Job satisfaction: an indication of what we expect, not just the work we do", NatCen Social Research http://www.natcen.ac.uk/blog/job-satisfaction-an-indication-of-what-we-expect,-not-just-the-work-we-do (accessed 15-May-2015)

Millán, J.M., Congregado, E. and Román, C. (2012), "Determinants of self-employment survival in Europe", *Small Business Economics*, 38(2): 231-258.

Niittykangas, H. and Tervo, H. (2005), "Spatial variations in intergenerational transmission of self-employment", *Regional Studies*, 39: 319-32.

Parker, S. (2009), *The Economics of Entrepreneurship*, Cambridge: Cambridge University Press.

Parker, S. and Robson, M.T. (2004), "Explaining international variations in self-employment: evidence from a panel of OECD countries", *Southern Economic Journal*, 71: 287-301.

Reynolds, P., Storey, D. and Westhead, P. (1994), "Cross national comparisons of the variation in new firm formation rates", Regional Studies, 28: 443-456.

Ritsila, J. and Tervo, H. (2002), "Effects of unemployment on new firm formation: micro-level panel data evidence from Finland", *Small Business Economics*, 19(1): 31-40.

Robson, M.T. (1998), "Self-employment in UK regions", *Applied Economics*, 30(3): 313-322.

Storey, D.J. (1991), "The birth of new firms – does unemployment matter? A review of the evidence", *Small Business Economics*, 3: 167-178.

Taylor, M.P. (2001), "Self-employment and windfall gains: evidence from panel data", *Economica*, 68: 539-65.

Tervo, H. (2006), "Regional unemployment, self-employment and family background", *Applied Economics*, 38(9): 1055-62.

Thurik, A.R., Carree, M, van Stel, A and Audretsch, D. (2008), "Does self-employment reduce unemployment", *Journal of Business Venturing*, 23(6): 673-686.

Table 1: UK Employment and Self-Employment Growth 2008-2014

	Total Employment '000s	Employees '000s (% of total)	Self-Employment '000s (% of total)	Business Stock[+] '000s
2008 quarter 1	29,510	25,428 (86.2%)	3,858 (13.8%)	4,075
2014 quarter 2	30,430	25,630 (84.2%)	4,551 (15.8%)	4,367
Change	+920	+202	+693	+292
Inflow 2009-2014*			1,669 (36.5%)	
Outflow 2009-2014*			886 (23.4%)	

Source: UK Office for National Statistics
Notes: * inflow measured as percentage of 2014 total self-employed who had entered within last 5 years; outflow measured as percentage of 2009 total who had left self-employment compared to 5 years previously. [+] registered and unregistered (for VAT and PAYE), 0 to 10 employees.

Table 2: Changes in Self-Employment by UK NUTS1 Region, 2008-2013

	2008 annual average self-employment '000s	2013 annual average self-employment '000s	Change '000s	Change %
England:				
North East	112	125	+13	+11.6
North West	363	426	+63	+17.4
Yorks & Humberside	290	312	+22	+7.6
East Midlands	239	258	+19	+7.9
West Midlands	288	337	+49	+17.0
East of England	395	442	+47	+11.9
London	571	679	+108	+18.9
South East	577	676	+99	+17.2
South West	383	424	+41	+10.7
Wales	174	192	+18	+10.3
Scotland	268	286	+18	+6.7
Northern Ireland	123	112	-11	-8.9

Source: UK Office for National Statistics and Northern Ireland, Dept of Trade, Enterprise and Investment

Table 3: USoc Sample Self-employment Levels and Transition Rates

	Wave 1 2009-10	Wave 2 2010-11	Wave 3 2011-12	Wave 4 2012-13
Males and females:				
Self-employment (as % of all employment)	3758 (13.3%)	4046 (13.2%)	3857 (13.8%)	3729 (13.9%)
Self-employed business ownership (as % of all employment)	2875 (10.2%)	3138 (10.2%)	2988 (10.7%)	2899 (10.8%)
All transitions into self-employment	-	477	585	569
All transitions into self-employed business ownership	-	320	379	395
Transitions from inactivity into self-employment	-	251	297	291
Transitions from inactivity into self-employed business ownership	-	164	188	194
Males only:				
Self-employment (as % of all employment)	2580 (18.4%)	2802 (18.3%)	2605 (18.7%)	2513 (18.8%)
Self-employed business ownership (as % of all employment)	1976 (14.1%)	2164 (14.1%)	2047 (14.7%)	1937 (14.5%)
All transitions into self-employment	-	309	346	340
All transitions into self-employed business ownership	-	207	225	225
Transitions from inactivity into self-employment	-	154	171	154
Transitions from inactivity into self-employed business ownership	-	98	111	96
Females only:				
Self-employment (as % of all employment)	1178 (8.3%)	1244 (8.1%)	1252 (8.9%)	1216 (9.1%)
Self-employed business ownership (as % of all employment)	899 (6.3%)	974 (6.3%)	941 (6.7%)	962 (7.2%)
All transitions into self-employment	-	168	239	229
All transitions into self-employed business ownership	-	133	154	170
Transitions from inactivity into self-employment	-	97	126	137
Transitions from inactivity into self-employed business ownership	-	66	77	98

Table 4: Bivariate correlation analysis of self-employment transitions and local labour market conditions

Correlation (Two-sample t-test)	UR - all	Q25E-all	UR - males	Q25E - males	UR - females	Q25E - females
Self-employment status	-0.050 (***0.000***)	0.076 (***0.000***)	-0.047 (***0.000***)	-0.013 (***0.019***)	-0.059 (***0.000***)	0.009 (*0.091*)
Self-employment transition in previous year from any status	-0.009 (***0.003***)	0.035 (***0.000***)	0.002 (0.692)	0.015 (***0.001***)	-0.021 (***0.000***)	0.017 (***0.000***)
Self-employment transition in previous year from employment	-0.003 (0.519)	0.037 (***0.000***)	0.003 (0.605)	0.005 (0.423)	-0.012 (***0.046***)	0.018 (***0.002***)
Self-employment transition in previous year from inactivity	-0.014 (***0.001***)	0.031 (***0.000***)	-0.001 (0.846)	0.021 (***0.001***)	-0.025 (***0.000***)	0.018 (***0.002***)
Self-employed business ownership status	-0.049 (***0.000***)	0.048 (***0.000***)	-0.047 (***0.000***)	-0.032 (***0.000***)	-0.057 (***0.000***)	-0.014 (***0.009***)
Self-employed business ownership transition in previous year from any status	-0.011 (***0.001***)	0.022 (***0.000***)	0.001 (0.886)	0.008 (0.108)	-0.023 (***0.000***)	0.004 (0.319)
Self-employed business ownership transition in previous year from employment	-0.009 (***0.054***)	0.024 (***0.000***)	0.002 (0.755)	0.001 (0.869)	-0.023 (***0.000***)	0.004 (0.950)
Self-employed business ownership transition in previous year from inactivity	-0.017 (***0.000***)	0.026 (***0.000***)	-0.006 (0.438)	0.014 (0.052)	-0.026 (***0.000***)	0.006 (0.288)
Would like to be self-employed in the future (age 16-21)	0.022 (0.123)	0.114 (***0.000***)	0.053 (***0.011***)	0.061 (***0.003***)	-0.004 (0.827)	0.063 (***0.001***)

Source: author's computations from Understanding Society Waves 1 to 4
Notes: UR – local authority district of residence unemployment rate 12 months previously; Q25E – local authority district 1st quartile weekly earnings in previous year; *italic* denotes p-value below 0.1, ***bold italic*** below 0.05

Table 5: Multivariate regression (probit) model estimates for self-employment status

Coefficient (p-value)	(1)	(2)	(3)
	Probit	Probit	Random Effects Probit
Local unemployment rate (lagged)	-0.012 (***0.034***)	-0.021 (***0.000***)	-0.054 (***0.001***)
Local 1st quartile earnings (lagged, gender specific £'00s) (median earnings in column 3)	-0.055 (***0.023***)	0.031 (0.124)	0.107 (***0.010***)
Gender (female=1)	-0.476 (***0.000***)	-0.423 (***0.000***)	-1.005 (***0.000***)
Age (years)	0.020 (***0.000***)	0.020 (***0.000***)	0.053 (***0.000***)
Ethnicity (reference: white British)			
White, non-British	0.242 (***0.000***)	0.270 (***0.000***)	0.788 (***0.000***)
African-Caribbean	-0.183 (***0.002***)	-0.107 (*0.059*)	-0.197 (0.248)
Asian	0.120 (***0.005***)	0.160 (***0.000***)	0.235 (*0.075*)
Chinese and other East Asian	0.104 (0.209)	0.158 (*0.053*)	0.495 (***0.039***)
Other	0.105 (0.194)	0.145 (*0.075*)	0.399 (*0.095*)
Highest educational attainment (reference: below age 16 school qualifications)			
University or college first degree or higher	0.014 (0.567)	0.031 (0.207)	-0.008 (0.923)
Vocational qualification including HNDs	-0.250 (***0.000***)	-0.239 (***0.001***)	-0.679 (***0.002***)
A-levels or equivalent aged 18	-0.065 (*0.075*)	-0.053 (0.141)	-0.162 (0.152)
O-levels/GCSEs or equivalent aged 16	-0.035 (0.172)	-0.022 (0.389)	-0.088 (0.278)
Father was business owner/employer	0.125 (***0.008***)	0.128 (***0.006***)	0.313 (***0.027***)
Mother was business owner/employer	0.003 (0.962)	0.004 (0.944)	0.021 (0.908)
Rural location	0.215 (***0.000***)	0.193 (***0.000***)	0.462 (***0.000***)
NUTS 1 regional controls	Yes	No	No
Time controls	Yes	No	Yes
N	31337	31337	31337
NT	66083	66083	66083
LogL	-24537.7	-24618.2	-14540.0
Pseudo R-sqrd	0.069	0.066	-
Proportion of error variance contributed by panel level error variance, ρ	-	-	0.992

Source: author's computations from Understanding Society Waves 1 to 4

Notes: Sample – all economically active. P-values (columns 1 and 2) are computed after adjustment of standard errors for clustering by individual. *Italic* denotes significance at 0.1 or higher, ***bold italic*** at 0.05 or higher. Median earnings are used in column to achieve model likelihood convergence.

Table 6: Multivariate regression (probit) model estimates for transitions to self-employment

Coefficient (p-value)	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Probit	Probit	Random effects probit	Probit	Random effects probit	Random effects probit	Probit
Local unemployment rate (lagged)	-0.012 (*0.052*)	-0.015 (***0.005***)	-0.016 (***0.003***)				
Local unemployment x male				0.003 (0.646)	0.003 (0.684)	0.012 (0.132)	0.014 (*0.073*)
Local unemployment x female				-0.043 (***0.000***)	-0.045 (***0.000***)	-0.027 (***0.015***)	-0.024 (***0.019***)
Local unemployment x male x previously inactive						-0.033 (***0.022***)	
Local unemployment x female x previously inactive						-0.047 (***0.005***)	
Local unemployment x male x years duration of previous inactivity							-0.006 (***0.000***)
Local unemployment x female x years duration of previous inactivity							-0.005 (***0.000***)
Local 1st quartile earnings (lagged, gender specific £'00s)	-0.013 (0.620)	0.069 (***0.001***)	0.067 (***0.002***)				
Local 1st quartile earnings x male				0.046 (*0.058*)	0.045 (*0.086*)	0.029 (0.286)	0.017 (0.559)
Local 1st quartile earnings x female				0.125 (***0.000***)	0.123 (***0.001***)	0.069 (*0.070*)	0.095 (***0.029***)
Local 1st quartile earnings x male x previously inactive						0.064 (***0.001***)	0.074 (***0.000***)
Local 1st quartile earnings x female x previously inactive						0.124 (***0.000***)	(0.105) (***0.000***)
Gender (female=1)	-0.263 (***0.000***)	-0.212 (***0.000***)	-0.226 (***0.000***)	-0.260 (*0.058*)	-0.262 (*0.086*)	-0.241 (0.116)	-0.343 (*0.055*)
Age (years)	-0.007 (***0.000***)	-0.007 (***0.000***)	-0.007 (***0.000***)	-0.007 (***0.000***)	-0.007 (***0.000***)	-0.008 (***0.000***)	-0.008 (***0.000***)
Ethnicity (reference: white British)							

White, non-British	0.154 (***0.008***)	0.183 (***0.002***)	0.195 (***0.001***)	0.176 (***0.003***)	0.188 (***0.002***)	0.195 (***0.001***)	0.164 (***0.011***)
African-Caribbean	-0.033 (0.568)	0.029 (0.605)	0.033 (0.571)	0.029 (0.610)	0.033 (0.572)	0.028 (0.632)	-0.035 (0.612)
Asian	-0.033 (0.460)	0.006 (0.899)	0.007 (0.881)	0.003 (0.951)	0.004 (0.934)	-0.011 (0.815)	-0.014 (0.795)
Chinese and other East Asian	0.093 (0.260)	0.137 (*0.092*)	0.150 (*0.080*)	0.133 (0.102)	0.145 (*0.089*)	0.129 (0.137)	0.137 (0.149)
Other	0.131 (*0.080*)	0.168 (***0.024***)	0.180 (***0.025***)	0.165 (***0.027***)	0.177 (***0.027***)	0.172 (***0.034***)	0.145 (*0.099*)
Highest educational attainment (reference: below age 16 school qualifications)							
University or college first degree or higher	0.180 (***0.000***)	0.196 (***0.000***)	0.204 (***0.000***)	0.196 (***0.000***)	0.203 (***0.000***)	0.235 (***0.000***)	0.144 (***0.000***)
Vocational qualification including HNDs	-0.015 (0.839)	-0.005 (0.951)	-0.006 (0.941)	-0.008 (0.911)	-0.009 (0.898)	0.003 (0.970)	0.008 (0.921)
A-levels or equivalent aged 18	0.005 (0.899)	0.021 (0.606)	0.016 (0.695)	0.022 (0.591)	0.017 (0.681)	0.025 (0.552)	0.017 (0.721)
O-levels/GCSEs or equivalent aged 16	0.061 (***0.033***)	0.074 (***0.010***)	0.074 (***0.013***)	0.075 (***0.009***)	0.075 (***0.012***)	0.086 (***0.004***)	0.071 (***0.033***)
Father was business owner/employer	0.097 (***0.035***)	0.099 (***0.032***)	0.108 (***0.028***)	0.098 (***0.034***)	0.106 (***0.031***)	0.102 (***0.040***)	0.078 (0.142)
Mother was business owner/employer	-0.028 (0.676)	-0.025 (0.713)	-0.028 (0.690)	-0.022 (0.748)	-0.025 (0.723)	-0.019 (0.795)	0.006 (0.929)
Rural location	0.124 (***0.000***)	0.101 (***0.000***)	0.106 (***0.000***)	0.104 (***0.000***)	0.108 (***0.000***)	0.110 (***0.000***)	0.073 (***0.011***)
NUTS 1 regional controls	Yes	No	No	No	No	No	No
Time controls	Yes	No	Yes	No	Yes	No	No
N	49553	49553	49553	49553	49553	49553	39046
NT	106523	106523	106523	106523	106523	106523	86224
LogL	-7857.8	-7885.0	-7875.4	-7873.4	-7864.1	-7847.8	-5789.4
Pseudo R-sqrd	0.031	0.028	-	0.029	-	-	0.035
Proportion of error variance contributed by panel level error variance, ρ	-	-	0.086	-	0.084	0.101	-

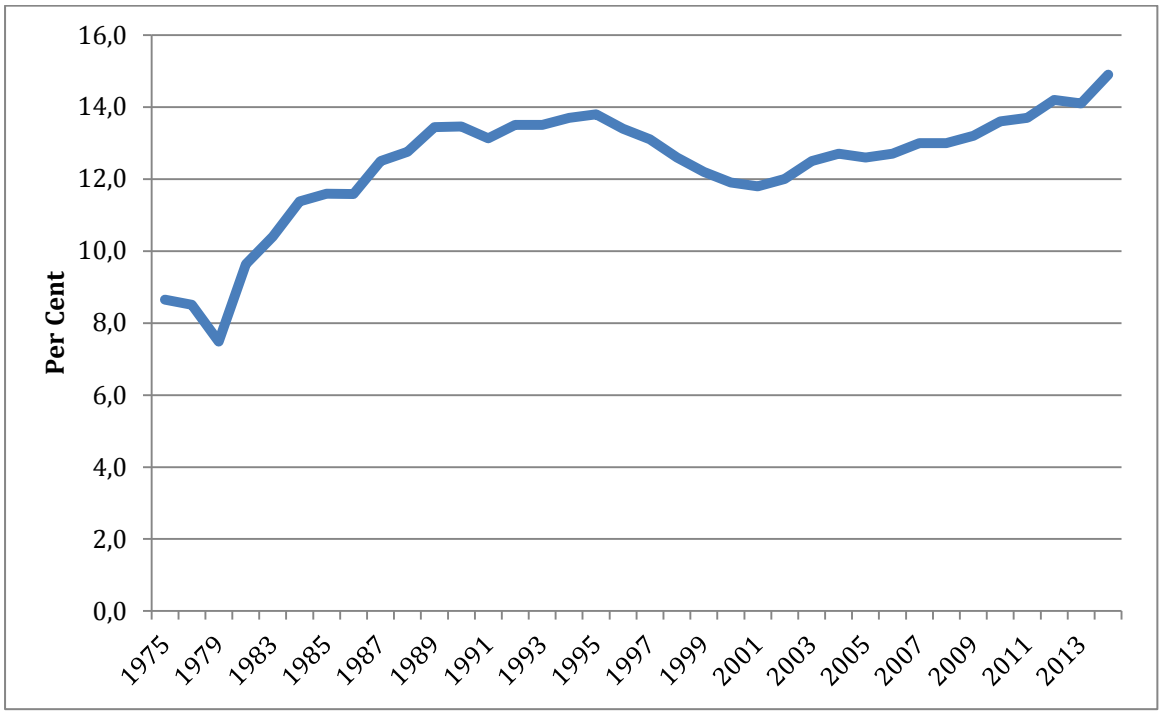
Source: author's computations from Understanding Society Waves 1 to 4
Notes: Sample – all adults. P-values (columns 1,2 and 4) are computed after adjustment of standard errors for clustering by individual. *Italic* denotes significance at 0.1 or higher, ***bold italic*** at 0.05 or higher.

Table 7: Multivariate regression model estimates for future self-employment likelihood (16-21 year olds)

Coefficient (p-value)	
Local unemployment x male	0.005 (*0.078*)
Local unemployment x female	-0.004 (0.178)
Local 1st quartile earnings x male	0.019 (0.118)
Local 1st quartile earnings x female	0.027 (***0.038***)
Gender (female=1)	-0.037 (0.560)
Age (years)	-0.012 (***0.000***)
Ethnicity (reference: white British)	
White, non-British	0.069 (0.108)
African-Caribbean	0.118 (***0.000***)
Asian	0.016 (0.326)
Chinese and other East Asian	0.009 (0.817)
Other	0.165 (***0.000***)
Father was business owner/employer	0.070 (***0.007***)
Mother was business owner/employer	0.002 (0.946)
Rural location	0.022 (*0.078*)
NUTS 1 regional controls	No
Time controls	No
N	3670
NT	4939
R-sqrd	0.041

Source: author's computations from Understanding Society Waves 1 to 4
Notes: Ordinary least squares regression, dependent variable expressed as probability between 0 and 1. Sample – 16-21 year olds. P-values (columns 1 and 2) are computed after adjustment of standard errors for clustering by individual. *Italic* denotes significance at 0.1 or higher, ***bold italic*** at 0.05 or higher.

Figure 1: UK Self-employment Rate 1975-2014



Source: UK ONS

Figure 2: UK Self-employment and Unemployment 2000-2014

Source: UK Office for National Statistics (NOMIS)