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SELF EMPLOYMENT: A LAST RESORT OR A LONG RUN DECISION? EVIDENCE FROM SELF-EMPLOYED INDIVIDUALS AND THOSE WHO EMPLOY OTHERS

Marc Cowling and Peter Mitchell

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Self-Employment: A Last Resort or a Long-Run Decision? Evidence from Self-Employed Individuals and those who Employ Others

by

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Self-Employment: A last resort or a long-run decision?
Evidence from self-employed individuals and those who employ others.

Marc Cowling* and Peter Mitchell**

Preliminary: Please do not quote without authors permission.

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I Introduction

The substantial rise in UK self-employment over the 1980s has been well documented in a number of recent studies (see for example Robson (1994) and Cowling and Mitchell (1995)). Yet there has been no significant attempt, to date, to link in the increases in self-employment over the period with increases recorded in the small business sector as a whole, particularly at the micro-firm level. The two groups have, in much of the literature, been treated in isolation. It is our contention that there is a significant component of the self-employed that are, to all intents and purposes, micro-businesses, namely the self-employed with employees. Our argument follows that they are significantly different in both the way they are managed, the constraints they face at the pre and post start-up stage and in policy terms from the individually self-employed. As such they should be investigated accordingly i.e as two distinct groups. That is to say the decision rules for people choosing to enter either of these two categories of self-employment will be different.

In 1979 UK self-employment accounted for some 7.6% of the workforce in employment, yet only a decade later this proportion had risen to around 12.5%, around 3.3 million workers, with positive growth rates recorded for all intermediate years. It was only the onset of recession in 1990 that called a halt to this dramatic rise in the importance of self-employment with the self-employed proportion of the workforce falling back to 12% by 1993.

However, if we then decompose the self-employed into two subsets, namely; (a) individually self-employed (forthwith referred to as ISEs), and (b) self-employed with employees (forthwith referred to as SEWEs), the picture is very different. At the ISE level, the underlying trend is one of dramatic positive growth between 1981 and 1992, although the series does become more noisy post-1990 as we enter recession. In 1981, for instance, ISEs accounted for some 5.1% of the workforce in employment. By 1993 this figure had reached 8.8%. By contrast, SEWEs recorded significant positive growth between 1981 and 1987 by which time they peaked at around 4.2% of the

---

1 A micro business can be defined as a business with less than 10 employees.
workforce in employment, from a base in 1981 of 3.4%. From 1987 however, there was a substantial fall to 3.9%, before a levelling off period, after which the relative importance of this group fell almost vertically to a level below that recorded in 1981.

With these issues in mind, the aim of this paper is to explore, using time-series analysis, self-employment in the UK over the period 1981 to 1992 by decomposing the total level into ISEs and SEWEs. Section II develops the theoretical framework for the analysis in terms of two simple models. Section III provides a discussion of the relevant theoretical and empirical literature whilst Section IV reports the results. The final section provides a summary of our findings.

II. Developing a Theoretical Model for ISEs and SEWEs.

In this section we discuss, in the context of two simple theoretical models (see Blau,1987, or Rees and Shah,1986 for previous expositions), the decision rules which ISEs and SEWEs use to determine the choice between three labour market states, namely self-employment, paid (or waged) employment and unemployment. The individual, who we assume to be risk-neutral, simply compares expected utility from each activity.

For an ISE net income is defined as:

\[(1a) \quad Y^{ise} = R(\delta,K,\sigma) - rK\]

The corresponding definition for SEWEs is:

\[(1b) \quad Y^{sewe} = R(\delta,K,L,\sigma) - rK - wL\]

Here, \( R \) denotes real business revenue, \( K \) the amount of capital invested and \( r \) the interest rate on capital. \( \delta \) is a shift parameter in the revenue function which reflects the individuals human capital. The latter is assumed to be known by the individual but not
by other agents. \( \sigma \) is a random variable which captures fluctuations in aggregate demand around trend levels and finally \( w \) is the wage rate paid to labour which is denoted \( L \).

Utilising a Cobb-Douglas functional form for \( R(\cdot) \), the income from self-employment is:

\[
(2a) \quad Y_{i}^{\text{ise}} = \sigma \delta i K^{\alpha} - rK, \quad 0 < \alpha < 1
\]

, and,

\[
(2b) \quad Y_{i}^{\text{swe}} = \sigma \delta i K^{\alpha} L^{\beta} - rK - wL \quad \alpha + \beta < 1
\]

We now have to pay attention to the revenue function with respect to the 'own-labour' input of the entrepreneur and the labour input of employees. Here, we assume perfect substitutability between 'own-labour' and other labour. Thus the entrepreneur is simply augmenting his or her 'own-labour' by the labour of others. As such, we allow for the entrepreneur to assign a shadow value of 'own-labour' to equal the market wage. By doing so we obtain the following revenue functions:

\[
(3a) \quad R^{\text{ise}} = \sigma \delta i K^{\alpha} L - rK \quad \text{where, } L = 1.
\]

, and,

\[
(3b) \quad R^{\text{swe}} = \sigma \delta i K^{\alpha} (1 + L)^{\beta} - w(L+1) - rK \quad \text{where } (1 + L) = \bar{L}.
\]

Thus both \( L \) and for \( \text{SEWEs } \bar{L} \) can be defined as total employment. To tie up the model neatly, we assume decreasing returns to scale of labour.

The optimal choice of \( K \) (and \( L \) for \( Y_{i}^{\text{swe}} \)) is obtained by differentiating \( Y_{i}^{\prime} \)s with respect to \( K \) (and \( L \) for \( Y_{i}^{\text{swe}} \)). Dropping subscript ‘i’ for convenience.
\( K^{w*} = \left( \frac{\sigma \delta \alpha}{r} \right)^{\frac{1}{1-\alpha}} \)

For SEWEs we obtain:

\( \sigma \delta \alpha K^{\alpha-1} L^{\beta} - r = 0 \)

\( \sigma \delta K^{\alpha} L^{\beta-1} - w = 0 \)

Thus, by rearrangement we obtain:

\( \left( \frac{\alpha}{\beta} \right) \left( \frac{L}{K} \right) = \frac{r}{w} \)

and

\( L = \frac{r \beta k}{\alpha w} \)

To obtain the optimal \( K \), we substitute \( L \) in (4d) into (4b) which gives:

\( K^{w*} = \left( \frac{\alpha w}{r \beta} \right)^{\beta} \frac{\sigma \delta \alpha}{r} \left( \frac{1}{1-\alpha-\beta} \right) \)

where,

\( K^{w*} = \mu^{\alpha-1} w^{\alpha+\beta-1} \sigma^{\alpha-1} s^{\alpha+\beta-1} \alpha^{\alpha+\beta-1} \beta^{\alpha+\beta-1} \alpha^{\beta-1} \beta^{\beta-1} \)

Thus the optimal capital is increasing in the level of demand and the human capital of the entrepreneur and decreasing in interest rates.

On the issue of finance, there are essentially two sources of finance available for the vast majority of business start-ups, namely the individuals stock of wealth and borrowing from financial institutions, ostensibly clearing banks. Other higher grade sources of finance are typically unavailable in packages of less than £200,000 due to
high fixed costs of loan evaluation and high monitoring costs. With this in mind, and taking into account that each persons ability is not directly observable by banks, the possibility of credit rationing occurs with some individuals facing a constraint on the amount they can borrow. We assume at this point that individual wealth has two components, liquid assets, $A^L$ and non-liquid assets, $A^{NL}$ which includes physical assets such as housing wealth. The latter is of the utmost importance since its value may be used as collateral against which borrowing may be secured. If we assume that the supply of lending is proportional to the value of non-liquid assets, then the self-employed person at the start-up stage has a total available finance of $A$, where:

$$A = A^L + \lambda A^{NL} \quad 0 < \lambda < 1$$

This represents the total capital available to fund start-up. We note here that if $K^* > A$, then self-employment is not optimal which we define as credit constrained. Furthermore, the capital required to fund an SEWE is greater than the capital required to fund an ISE. On this basis we would expect that there is a greater potential for capital constraints to occur at the with employees level where there is a higher optimal level of start-up capital.

Having derived the optimal $K$, we can now move on to consider optimal $L$. By substituting (5a) into (4d) we obtain:

$$L^* = \frac{r \beta}{\alpha w} \left[ \frac{\sigma \delta \alpha}{r \left( \frac{\alpha w}{r \beta} \right)^\beta} \right]^{1-\alpha-\beta}$$

By collecting common terms we obtain:

$$L^* = \left[ \left( \frac{\alpha w}{r \beta} \right)^{1-\alpha} \frac{r}{\sigma \delta \alpha} \right]^{1-\alpha + \beta - 1}$$
therefore,

\[ L^{sewe} = a^{\alpha + \beta - 1} w^{\alpha + \beta - 1} r^{\alpha + \beta - 1} \sigma^{\alpha + \beta - 1} \delta^{\alpha + \beta - 1} \]

Thus the optimal labour force is declining in the real wage and interest rates and increasing in demand and human capital.

Having derived the respective revenue functions for ISEs and SEWEs, we can state that for individuals currently in paid employment entry into self-employment is desirable if:

\[ E[Y^{ise} - Y^e] > 0 \]  
(8a)

\[ E[Y^{sewe} - Y^e] > 0 \]  
(8b)

Where income earned in paid employment is \( Y^e \).

Substituting for \( Y^{ise} \) from equation (2a) gives:

\[ \sigma \delta K^\alpha - rK - w > 0 \]  
(9a)

Likewise, substituting \( Y^{sewe} \) from equation (2b) gives:

\[ (\sigma \delta K^\alpha L^1 - rK - wL) - w > 0 \]  
(9b)

For unemployed individuals, entry into self-employment is derived in the same fashion with unemployment income represented thus:
(10) \[ Y^a = qw + (1-q)b \]

For ISE,

(11) \[ qw + (1-q)b < \sigma \delta K^\alpha - rK \]

and for SEWE,

(12) \[ qw + (1-q)b < \sigma \delta K^\alpha (1+L)^\beta - rK - w(1+L) \]

where \( b \) is unemployment benefits and \( q \) the probability that an individual receives an acceptable job offer, in which case he or she receives \( w \) the employed wage.

III. Theoretical Framework and Variable Selection

(i) Labour Market

There are conflicting theories which attempt to reconcile the individuals state in the labour market and the likelihood of entering self-employment. On the one hand it is posited that unemployment acts as a catalyst for entry into self-employment by effectively lowering the opportunity cost of self-employment. This is supported empirically by Black, De Meza and Jeffreys (1992) and also by Robson (1993). On the other hand Coate and Tennyson (1992) argue that, ‘marginalised workers who are discriminated against in the labour market may indeed have less incentive to enter self-employment.’ This theme is developed in Blanchflower and Freeman (1993) who suggest that self-employment can be an unstable and poor paying option forced onto people unable to find work as wage or salary earners. Given the ambiguous predictions, the relationship between unemployment and self-employment is one of our main points of focus. Further to this we will also investigate alternative wage theories in deference to Fujii and Hawley (1991) who found that, ‘by far the most powerful
predictor of choice of mode of work is the predicted income differential.' This is also consistent with the empirical work in Cowling and Mitchell (1995) who found the employed wage/self-employed income differential to be an important factor in the rise of UK self-employment since 1972.

(ii) Finance and Credit Markets

The role of capital markets with respect to business start-ups and smaller businesses more generally has been the focus of a considerable amount of theoretical and empirical work in the last decade on both sides of the Atlantic. Access to, and cost of capital have been identified as a significant constraint on small businesses, most notably in the theoretical work of Blinder (1987) and in the empirical survey work by Binks et al (1990,1992) and Cowling et al (1991).

Wealth, defined as liquid and non-liquid assets, has been the subject of much of this debate. Calomiris and Hubbard (1990), for example, outline a model in which, 'external finance will be differentially available to entrepreneurs.....according to their internal net worth position.' This is in line with Coates and Tennyson who state that, 'the key market relevant to self-employment is the credit market.' One specific determinant that has been identified in all of the major UK studies of this nature has been the housing market. Given that a persons house is likely to be the single largest asset that people possess, the role of house prices and housing equity as a means of either releasing capital or as a means of securing bank debt are clearly an important factor in raising external finance.

(iii) Taxation and the Role of Government

Small businesses and the self-employed have been the focus of a great deal of government attention since 1979. The stated desire to create a dynamic and flexible labour market based on an expanded small business sector has ensured that massive government support has been targetted on this area. perhaps the most notable schemes have been the Enterprise Allowance Scheme, set up in 1983 to encourage the
unemployed to set up in business by subsidising their income for up to one year post start-up, and the Loan Guarantee Scheme, set up in 1981 to alleviate capital constraints that smaller firms were perceived to be facing.

On a broader scale, there were significant changes in the structure of UK taxation. There were shifts in the impact of taxation away from direct taxes towards indirect taxes. Of particular significance were the removal of zero VAT ratings on previously exempt building works and the imposition of VAT on take-away food. Over the same period, standard rates of personal and business taxes were lowered (considerably in some cases).

As De Wit (1993) correctly points out, ‘the effects of taxes are ambiguous.’ Yet there is a not inconsiderable volume of evidence that points to the ability of the self-employed to hide income and under-report their earnings. Pessarides and Weber (1989) for example, suggest that, ‘the [UK] National Accounts are adjusted upwards by something like 15 per cent of reported self-employment income to account for tax evasion.’ They further estimate that mean declared incomes [of the self-employed] have to be multiplied by between 1.54-1.87 for white collar and 1.64-1.92 for blue collar workers to arrive at true incomes. Empirically, Robson (1993) found that rises in average tax rates had a positive impact upon self-employment.

Thus our interest is to test the validity of utility (income) based switching models of self-employment in the first instance and secondly to identify whether there are differences in the decision rules governing entry into self-employment as an ISE or SEWE. The dependent variables are thus defined as the natural logs of the ratio of ISEs and SEWEs to the total workforce respectively.
IV. Analysing ISEs and SEWEs.

The modelling procedure adopted was to use the two step OLS estimator proposed by Engle and granger to specify two Error Correction Models (ECM). Initially we focus on the determinants of the equilibrium or long-run behaviour of ISEs and SEWEs. The implied long-run variables were tested using the Johansen ML Procedure to establish whether they did indeed form a unique cointegrating vector. These long-run variables were subsequently tested using the Augmented Dicky-Fuller Test to establish the order of integration. The conclusion from the ADF statistics are that all the variables can be considered I(1)\(^2\). Then the residuals from step 1, which are interpreted as a measure of deviation from equilibrium, are incorporated in a dynamic model which focuses on short-run behaviour. Essentially if according to our steady state description of self-employment the respective proportions are below their equilibrium levels then the model predicts growth in self-employment and vice-versa.

**ISE: Long-Run**

The coefficient estimates of the long-run model are presented below. The model exhibits positive effects from real wages in the employed sector and real profits in the company sector and negative effects from personal tax rates and short-run unemployment.

\[ \ln \text{ISE} = 1.21 - 0.11 \ln \text{TAX} + 0.34 \ln \text{PROF} - 0.02 \ln U_s + 1.47 \ln Y^e \]

Sample 1981q1-1992q1 \hspace{1cm} R^2 = 0.97 \hspace{1cm} ADF = -4.92

The role of personal taxes is interesting in that high taxes tend to discourage self-employment at the ISE level presumably via the income effect. The implication being that individuals are reluctant to enter self-employment and be responsible for their own destinies if they are not able to receive the lions share of the gross income they generate. This tends to support the government rationale for tax cuts in the eighties as

\(^2\) The results of the Johansen procedure and the ADF tests are reported in the appendix.
a means of encouraging people to change the nature of their work organisation. It also
tends to refute the notion that people move into self-employment as a means of
avoiding tax, but that is not to say that once in self-employment people do not then
under-report their income.

The positive relationship between ISE and the real employed wage appears at first to
offer support for rejecting income based switching models of labour market states.
Yet there is clearly other effects which may be better at explaining this relationship.
For instance, individuals experiencing high wage growth in the employed sector
might feel confident that their abilities might be better put to use in the self-employed
sector where there is greater potential for determining their work hours and
furthermore of being rewarded for greater effort. Conversely, if we assume that
individuals have some expected target income level, then it might require less work in
self-employment to achieve that threshold. This appears to be borne out by Labour
Force Survey data which reports a decline in hours worked amongst the self-employed
over the 1980s.

Regarding real company profits, this is consistent with entry inducing behaviour on
the part of individuals (or in the industrial economic literature firms) where above
normal profits are being generated by existing firms in the market. Thus for the
currently employed bricklayer who sees a multitude of small construction firms
making good profits, this may be just the catalyst he needs to become self-employed
with the hope that in time he may also begin to employ others and reap the rewards or
perhaps in the hope that his self-employed labour might be demanded on a
subcontract basis by these existing firms. Indeed, the shift away from direct labour
towards subcontracting has been a prominent feature of the building industry since the
1970s.

The negative impact on short-run unemployment tends to suggest that for the majority
of recently unemployed individuals the option of self-employment comes second to
the job search process. This tends to imply that the relative security of paid
employment is the preferred option for most. The suggestion here being that those
with genuine entrepreneurial traits would either be self-employed already or would move there straight from paid employment. If we now consider those whose period of unemployment extends into the long-term, who are increasingly marginalised in the labour market maybe due to skills obsolescence then we might further expect a cohort of longer-term unemployed individuals who opt for self-employment as a last resort. This feature was apparent in the results reported by Cowling and Mitchell for aggregate UK self-employment over a much longer time period than the current study.

Short-Run:

\[
\Delta \ln \text{ISE} = 0.003 - 0.15 \text{ECM}_{t-1} + 0.18 \Delta \ln \text{HE}_{t-3} + 0.05 \Delta \ln U_t + 0.008 \Delta \ln \text{EAS}_{t-1} \\
\quad (3.04) \\
\quad (3.28) \\
\quad (2.86) \\
\quad (6.47) \\
- 0.34 \Delta \ln \text{TAX}_{t-3} \\
(4.26)
\]

R\text{2} = 0.68 \quad \text{Sample 1981q1-1992q1} \quad \text{Durbin-Watson}=1.68 \\
LM Test for Serial Correlation \( \chi^2(4)=1.65 \), LM Test for Normality \( \chi^2(2)=1.22 \), LM Test for Heteroscedasticity \( \chi^2(1)=0.21 \). Figures in parenthesis are T-statistics.

The short-run dynamic model shows that growth in housing equity, the level of long-term unemployment and the Enterprise Allowance Scheme all have a positive effect upon the growth rate of ISE. Conversely, growth in the rate of personal taxation exhibits a significant, and negative effect upon growth in this type of self-employment.

Regarding housing equity, our result confirms what a number of previous studies have found in that for the majority of small firms the role of the housing market is a key influence on the ability to overcome credit constraints via both a collateral effect and a
wealth effect. On collateral for example, given that, at this level, the only external financing option open to individuals and small firms is bank debt, the ability to obtain secured finance is (virtually) solely dependent upon the individuals ability to provide asset cover on a loan. The wealth effect of unreleased housing equity has assumed prominence since the financial deregulation of the mid-1980’s when, perhaps for the first time, individuals were able to release the equity locked up in their houses. This has reduced the likelihood of individuals being reliant upon banks for start-up funding, and thus reduced the likelihood of financial constraints preventing start-up.

The positive role of long-term unemployment and the Enterprise Allowance Scheme are particularly important here. Whilst the increases in self-employment over the last decade or so are often interpreted as signs of a revival of entrepreneurial spirits in the UK and as evidence of newly found dynamism in the labour market, the evidence presented here suggests that to a large degree this cohort of the self-employed do not fit the model of the risk-taking, entrepreneur. In fact, the results suggest that an important section of ISEs are in fact marginalised, structurally unemployed workers who are ultimately pushed into self-employment as a last resort when all other alternatives are exhausted. The role of the EAS, intended to encourage the long-term unemployed into self-employment via a wage subsidy does tend to lend support for the income based switching models of self-employment in that the subsidy tips the balance in favour of moving into self-employment rather than remaining in unemployment. Yet the evidence suggests that the majority of EAS encouraged self-employment entrants do not survive when the 12 month subsidy is removed.

On the issue of tax rates, the evidence clearly links the decreases in the burden of direct taxes over the last fifteen years in the UK to the growth in self-employment, and tends to support the notion that individuals are indeed influenced by the respective returns to their mode of employment particularly where one alternative has a potentially riskier stream of revenue attached to it i.e self-employment. There may also be an added incentive inherent in a low tax economy in that returns to effort are much higher when taxes are low which is perhaps of greater significance to those in control of their own labour rather than employees of firms.
SEWE: Long-Run

The coefficient estimates of the long-run model are presented below. The model exhibits positive effects from personal real net financial wealth and the self-employed waged employed income differential and negative effects from indirect taxes.

\[ \ln SEWE = -2.2 + 2.74 \ln \left( \frac{Y^w}{Y^e} \right) - 0.78 \ln VAT + 0.15 \ln RNFW \]

Sample 1981q1-1992q1 \( R^2 = 0.65 \) \( ADF = -4.52 \)

On taxes the results suggest that indirect taxes act in a significant and negative fashion in the long-run. This feature is important given that the government has actively sought to shift the burden in taxes away from direct taxes towards indirect taxes in the UK over the last fifteen years. Thus the net impact of such a policy on SEWEs is substantially different from that of ISEs who are more likely to fall below the VAT threshold. Indeed the extended coverage of previously exempt services, particularly in the building and catering sectors may have acted as a significant deterrent to SEWEs in these areas over the period measured. This VAT effect can also be tied in with the oft cited ‘burden of regulation and bureaucracy’ effect that appears in virtually all small business surveys relating to constraints on growth. An important feature here is that not only do VAT returns take a considerable amount of administration time but that returns are dealt with by Customs and Excise who have much greater powers than the Tax Office to censure firms and individuals.

On the income differential the elasticity on the long-run coefficient implies that a 2% rise in self-employment earnings relative to waged employment earnings will increase SEWEs by around 5.5%. This finding tends to support earlier and related work on self-employment, notably that of Fujii and Hawley (1991), Robson (1994) and Cowling and Mitchell (1995) who all found that the predicted income differential was a powerful influence on the individuals choice of mode of work. It also tends to suggest that, at least for SEWEs, that income based switching models of self-
employment do have a degree of validity. The implication being that at the ISE level
workers are simply substituting an employed wage for an equivalent self-employed
wage.

The positive effect on real personal financial wealth is consistent with the notion of
credit rationing in the sense that increases in wealth not only allow individuals to be
better equipped to self finance a start-up thus avoiding the possibility that banks may
ration credit to them, but also that housing wealth, which is likely to form a large part
of an individuals wealth, can be used to secure bank funding. This relates back to the
theoretical discussion in which we distinguished between liquid and non-liquid assets.
The important feature here is that at the SEWE level there is greater potential for
rationing to occur as the capital requirement at the start-up stage is much greater than
for the ISE. Thus, it is likely that individuals with higher levels of human capital (i.e
those who are more likely to become SEWEs) whom we might expect to be holding
other forms of wealth in addition to housing wealth may also have been the
beneficiaries of a disproportionate share of the wealth increases generated in the 1980s.

**Short-Run:**

\[
\Delta \text{lnSEWE} = 0.002 - 0.24 \text{ ECM}_{t-1} + 0.15 \Delta \text{lnRNFW}_{t-1} - 0.59 \Delta \text{lnY}^s_{t-3} \\
\hspace{1cm} (2.51) \hspace{2cm} (3.10) \hspace{2cm} (2.10) \\
-0.65 \Delta \text{lnVAT}_{t-3} - 0.18 \Delta \text{lnCTAX}_{t-1} \\
\hspace{1cm} (6.36) \hspace{2cm} (2.23)
\]

\[R^2=0.63 \quad \text{Sample 1981q2-1992q1} \quad \text{Durbin-Watson}=2.1\]

LM Test for Serial Correlation \(\chi^2(4)=4.39\), LM Test for Normality \(\chi^2(2)=1.93\), LM
Test for Heteroscedasticity \(\chi^2(1)=0.014\). Figures in parenthesis are T-statistics.

The dynamic error correction model once displays negative effects from real wages in
the employed sector and both direct taxes and indirect taxes (measured in growth
terms here). Interestingly, there is a wealth effect as was the case for ISEs but for SEWEs the relevant measure of wealth was defined in a much broader way than simply housing equity. This is consistent with the notion that SEWEs require much greater capital inputs at the start-up stage than ISEs and are more likely to have accumulated other forms of wealth that can be used to finance entry into self-employment.

Conclusion

There appears to be clear differences which distinguish between our two subsets of the self-employed. For SEWEs, the relative income differential is a key factor in the long-run, whereas for potential ISEs the focus of attention appears to be based upon the individuals expectation of being able to maintain secure waged employment or as a second best option replace a wage with an equivalent self-employed income.

Concerning start-up capital, access to funds for ISEs is strongly linked to the housing market via the collateral effect on the one hand and through increased ability to unlock housing equity as this form of wealth increased in tandem with the financial deregulation of the 1980s. For SEWEs, whose optimal capital inputs at this stage are greater, increases in other forms are wealth over the period were also important as additional means of financing start-up. This is consistent with the notion of capital constraints being more binding at the larger end of the scale than at the lower end. Indeed, it is interesting to note that the maximum available loan under the governments Loan Guarantee Scheme recently increased from £100,000 to £250,000.

Another interesting aspect concerns the role of taxation over the period. the policy of reducing direct taxes clearly had the desired effect of increasing the level of self-employment for both ISEs and SEWEs, yet for the latter group some of this effect was wiped out by the shift in the burden of taxation towards indirect taxes.
On unemployment, the evidence suggests that this is of little relevance to SEWEs, a feature which is consistent with our contention that potential SEWEs are likely to be at the higher end of the human capital distribution, switching between relatively well paid employment and high income self-employment. ISEs, on the other hand appear to be more reluctant entrepreneurs. For example, the negative effect of short-term unemployment in the long-run model contrasts with the positive effect of long-term unemployment in the dynamic model.

Thus it would seem that whilst SEWEs are pulled into self-employment for the most part, a significant proportion of ISEs are pushed into self-employment in the face of declining opportunities in waged employment.
Augmented Dickey-Fuller Tests

<table>
<thead>
<tr>
<th>Variable</th>
<th>ADF</th>
<th>First Difference (Δ) ADF</th>
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<tr>
<td>lnSEWE</td>
<td>-0.46</td>
<td>-3.91</td>
</tr>
<tr>
<td>lnRNFW</td>
<td>-1.48</td>
<td>-4.21</td>
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<td>lnVAT</td>
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<td>-3.78</td>
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<td>-4.29</td>
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<td>lnU_s</td>
<td>-2.37</td>
<td>-3.69</td>
</tr>
<tr>
<td>lnY^e</td>
<td>-2.78</td>
<td>-4.04</td>
</tr>
</tbody>
</table>

* All ADF statistics are reported with trend.

Johansen ML Procedure (Trended Case, with trend in DGP).

Cointegration LR Test Based on Maximal Eigenvalue of the Stochastic matrix.
Maximum Lag in VAR=4.

ISE:

<table>
<thead>
<tr>
<th></th>
<th>Null</th>
<th>Alternative</th>
<th>Statistic</th>
<th>95% Critical Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>r=0</td>
<td>r=1</td>
<td>116.93</td>
<td></td>
<td>33.46</td>
</tr>
<tr>
<td>r=1</td>
<td>r=2</td>
<td>26.41</td>
<td></td>
<td>27.07</td>
</tr>
</tbody>
</table>

SEWE:

<table>
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<th>Null</th>
<th>Alternative</th>
<th>Statistic</th>
<th>95% Critical Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>r=0</td>
<td>r=1</td>
<td>None</td>
<td></td>
<td>27.07</td>
</tr>
<tr>
<td>r=1</td>
<td>r=2</td>
<td>7.27</td>
<td></td>
<td>20.96</td>
</tr>
</tbody>
</table>
Variable List

\( \ln \text{ISE} \): The number of ISEs divided by the total workforce. Source, LFS

\( \ln \text{SEWE} \): The number of SEWEs divided by the total workforce. Source, LFS

\( \ln U_s \): Short-term unemployment (i.e. <52 weeks). Source, LFS

\( \ln U_l \): Long-term unemployment (i.e. >52 weeks). Source, LFS

\( \ln \text{EAS} \): Enterprise Allowance Scheme entrants. Source, DTI

\( \ln \text{HE} \): The value of housing wealth defined by the housing stock and the average dwelling price. Source, Housing and Construction Statistics

\( \ln Y^e \): The average employment wage. Source, Economic Trends

\( \ln \text{TAX} \): The standard rate of tax on personal income. Source, Annual Abstract of Statistics

\( \ln \text{CTAX} \): The standard rate of company taxation. Source, Annual Abstract of Statistics

\( \ln \text{VAT} \): The standard rate of Value Added Tax. Source, Annual Abstract of Statistics

\( \ln \text{PROF} \): Gross trading profits of companies after providing for stock appreciation adjusted for inflation. Source, Economic Trends

\( \ln \text{RNFW} \): Personal sector net financial wealth. Source, UK National Accounts

\( \ln Y^{se} \): The average income in self-employment. Source, Economic Trends
BIBLIOGRAPHY


