

## **Dabbled vs. Sustained Self-Employment: Exploring Educational Returns Within Dynamic Employment Groups.**

**Purpose:** This study examines the returns from education for three distinct groups: always employees, dabblers in self-employment, and sustained self-employed individuals. We aim to understand how educational attainment translates into earnings across these employment types in the UK.

**Design/Methodology/Approach:** Using data from the British Household Panel Survey (BHPS) and Understanding Society: The UK Household Longitudinal Study (UKHLS), we employ a random effects model to account for unobserved individual characteristics and the Heckman selection model to address self-selection bias, ensuring accurate estimates of educational returns.

**Findings:** Our findings indicate that sustained self-employed individuals benefit more from education compared to dabblers and, in certain cases, traditional employees. Dabblers with postgraduate education report higher returns than always employees, but those with lower educational levels experience disadvantages due to their intermittent labour market engagement.

**Originality/Value:** This study introduces new evidence on the heterogeneity of educational returns for self-employed individuals in the UK, providing a novel comparative analysis of different employment types and highlighting the unique challenges and outcomes related to educational attainment and earnings.

**Keywords:** education, dabblers, wage, higher education, earnings, human capital, self-employed, UK.

## **Introduction**

The classification of workers typically encompasses wage earners and sustained self-employed individuals. However, Hussein and Haj Yousef (2023) identified a third category: 'dabbled self-workers.' These are skilled labourers who oscillate between self-employment and wage earning. The significance of this group in the labour market – and how they differ from paid employees and the more sustained self-employed - warrants further exploration, particularly regarding the financial returns from education.

Establishing any difference in these returns between self-employed versus wage earners presents challenges due to inherent differences in characteristics, motivations, and control over human capital. Whilst previous work has attempted to identify these differences (Van Praag et al., 2013) there is a risk of bias in folding different worker types together (Henderson et al., 2011). Other work has attempted to overcome this issue by consider different types of self-employed: those spurred on by opportunity or by necessity (Fossen and Butter, 2013). Whilst revealing, this analysis cannot capture the longer-term behaviour of those who move into and out of self-employment – the dabblers who moves between the two forms of employment over their working lifetime.

Our paper tackles the complexities of calculating varied earnings returns from education among self-employed individuals. As well as estimating novel results on the differences between dabblers, sustained self-employed and paid employees we also address challenges of correctly identifying the returns from education. The key issues within the returns' literature on the inherent correlation between income and unobserved ability – the endogeneity problem - and the self-selection bias of measuring income with survey data are well rehearsed (e.g., Ashenfelter et al., 1999; Harmon et al., 2003; Shane, 2006; Dickson and Harmon, 2011).

We employ several techniques to navigate these challenges. This is particularly pertinent in understanding the earnings dynamics of those who alternate between self-employment and wage earning, a group we identify as selective in both employment states. By comparing their returns with sustained self-employed and wage earners, we aim to deepen the understanding of educational returns in self-employment. Accordingly, we aim to answer the following research questions:

- What are the respective earnings returns to formal education for the three groups of workers?
- Which group enjoys higher earnings returns from education?

The manuscript begins with an extensive literature review and theoretical framework, setting the stage for our methodological approach. This is followed by an in-depth analysis of our findings, concluding with remarks that synthesise these insights while acknowledging the study's limitations.

### **Literature Review**

Human Capital Theory, pioneered by Becker (1962) and Schultz (1963), posits that education increases earnings by enhancing productivity. Investing in human capital, through education, training, and work experience, involves costs such as tuition fees and forgone earnings, but yields future benefits like higher earnings and increased firm profitability (Blundell et al., 1999; Wasim et al., 2023). The theory suggests individuals will invest in education until the marginal returns match those of other assets, supported by empirical evidence of the positive link between education and earnings (Riley, 2001; Chevalier et al., 2004). Mincer (1974) introduced a method to quantify these returns, initially finding substantial returns of 15-20% in the UK (Chevalier and Walker, 2002; Harmon and Walker, 1999), though recent studies show a decline to 3-8%, attributed to life-cycle effects and differing data periods (Buscha and Dickson, 2016; Devereux and Hart, 2010; Grenet, 2013).

Educational returns vary significantly across countries and demographics. Mincer's early work (1974) using US census data found a 10% return for schooling and 8% for work experience. These returns generally surpass those seen in Europe, with notable gender differences—women in Great Britain experience higher returns of 8-12%, compared to 7-10% for men (Dearden, 1998; Chevalier et al., 1999). Despite consistent methodologies, this variability highlights the complexity and heterogeneity in assessing the economic value of education (Silles, 2007; Walker and Zhu, 2003).

The traditional view links education's value to potential earnings, with the primary cost being lost income during study (Walker and Zhu, 2001). However, this perspective oversimplifies education's role, as innate abilities and personal traits also significantly influence career success (Harmon et al., 2000). Education's impact on productivity differs between self-employed individuals and employees. For the self-employed, formal education may be less critical as they rely on their own capabilities, whereas employees see education as key for gaining knowledge and specialisation, boosting productivity.

Hussein and Haj Youssef (2021) distinguish between 'dabblers'—those intermittently self-employed—and 'sustainers', who maintain long-term self-employment. This distinction is vital, as it highlights varying motivations and economic contributions within self-employment. Dabblers often shift between self-employment and paid work, using self-employment as supplementary income, while sustainers are more deeply engaged, expanding their businesses and hiring employees. This differentiation enhances Human Capital Theory by showing how intermittent versus sustained self-employment affects educational investments and earnings returns. Recognising these differences is crucial for shaping educational policies and support tailored to these groups' diverse needs.

### *Personal Control Theory and Returns*

Personal Control Theory suggests that entrepreneurs, benefiting from greater autonomy, gain more career benefits from their education compared to wage earners (Iglesias et al., 2016; Van Praag et al., 2013). With fewer organisational constraints, they can apply their skills more effectively to maximise outcomes (Benz and Frey, 2008; Van der Sluis & Van Praag, 2004, 2007; Douhan & Van Praag, 2009). Traditionally, research on educational returns has focused on the wage sector, often overlooking self-employment due to difficulties in measuring income (Heckman et al., 2003; Veitch, 2007). Recent studies are addressing this gap but tend to treat the self-employed as a homogenous group, disregarding sector diversity (Sorgner et al., 2017).

US studies often show higher educational returns for entrepreneurs compared to employees, with entrepreneurs gaining a 10% benefit versus 7% for employees (Evans & Jovanic, 1989; Kawaguchi, 2003). Van Praag, Van Witteloostuijn, and Van der Sluis (2013) further explored the complex relationship between education and income, confirming that entrepreneurs, freed from organisational constraints, experience greater educational returns (Van Praag et al., 2009). Cross-sectional and panel studies also suggest that despite longer hours, higher risk, and income variability, entrepreneurs enjoy greater job satisfaction and autonomy than traditional employees (Blanchflower & Oswald, 1998; Hundley, 2001; Taylor, 1996; Benz & Frey, 2008).

Entrepreneurial research in Europe contrasts with US findings, showing lower educational returns for the self-employed in Germany and Italy, while the UK offers a more balanced picture (Mainar & Gomez, 2011; Sorgner et al., 2017). UK entrepreneurs often earn less than employees but report higher job satisfaction, reflecting the non-pecuniary benefits of autonomy and fulfilment (Hamilton, 2000; Blanchflower & Shadforth, 2007). Our study builds on this by distinguishing between 'dabblers'—those intermittently self-employed—and 'sustainers', who are more deeply committed to self-employment. This distinction highlights

differing motivations and contributions, with sustainers likely realising greater long-term educational returns due to sustained skill application (Hussein & Haj Youssef, 2021). Addressing the limitations of prior research that relied on short-term data, our study employs a more comprehensive methodology to compare educational returns across these subgroups. This approach not only refines our findings but also deepens the understanding of personal control theory within self-employment. The distinctions between types of self-employed individuals underscore the need for nuanced policy interventions to support diverse entrepreneurial pathways.

#### *Heterogeneity of self-employed and the returns from education*

A key challenge in assessing educational returns in the labour market is the endogeneity of education, complicated by unobserved factors like individual ability and self-selection into different employment types (Ashenfelter et al., 1999; Dickson and Harmon, 2011; Harmon et al., 2003; Shane, 2006). This issue is particularly pronounced in the self-employed sector, which includes freelancers, business owners, and contractors. The sector's diversity complicates accurate assessment of factors like income, education level, and degree type, as these vary widely based on personal and career choices.

The Global Entrepreneurship Monitor (GEM) distinguishes between opportunity and necessity entrepreneurs. Opportunity entrepreneurs pursue self-employment to leverage skills and drive growth, while necessity entrepreneurs turn to it as a last resort due to a lack of alternatives (Reynolds et al., 2002; Dawson and Henley, 2012). Combining these distinct motivations into one analytical category can distort research findings, potentially underestimating educational benefits for opportunity entrepreneurs and overestimating them for necessity-driven entrepreneurs, posing challenges for policymakers and aspiring entrepreneurs (Fossen and Buttner, 2013).

Recent empirical efforts have tackled the diversity in entrepreneurship. Fossen and Buttner (2013), using data from the German Socio-Economic Panel (SOEP), classified entrepreneurs based on prior unemployment, capturing necessity entrepreneurs. Block and Wagner (2010) applied a stricter criterion, focusing on those not out of wage employment for more than two years, to better identify motivations for self-employment. Their findings revealed that opportunity entrepreneurs saw a 4.3% return on education, while necessity entrepreneurs had negligible returns, though the study didn't fully address education's endogeneity. Necessity entrepreneurs typically spend less time in self-employment and have fewer years of education than opportunity entrepreneurs, though more than employees (Block and Sandner, 2009). Fossen and Buttner (2013) found necessity entrepreneurs earned 3% less in educational returns than both opportunity entrepreneurs and wage earners due to their involuntary circumstances. The distinction between opportunity and necessity entrepreneurship, though insightful, is inherently short-term. Fossen and Buttner (2013) and Block and Wagner (2010) classify entrepreneurs based on recent labour market behaviour, such as unemployment spells. Necessity entrepreneurs are those unemployed prior to self-employment, while opportunity entrepreneurs transition from employment. This approach captures educational returns for two potentially transient groups. In contrast, categorising self-employed individuals as dabblers or sustainers focuses on long-term labour market behaviour, offering a deeper understanding of how education influences income among the self-employed. Most research focuses on Germany and the US, leaving a gap in understanding the UK's unique entrepreneurial dynamics, particularly given Brexit and its cosmopolitan workforce (Herz and van Renz, 2020). Our research takes an integrative approach, addressing educational endogeneity and employment types, offering deeper insights into the UK labour market.

### **Hypotheses development**

Self-employment covers a wide range of workers, including freelancers, contractors, and business owners, each facing distinct challenges that shape their professional outcomes. Education and skills are crucial to their success. Sustained self-employed individuals, often opportunity entrepreneurs, use their education to create or seize business opportunities (Hussein and Haj Youssef, 2023). In contrast, dabbled self-employed workers engage in entrepreneurial activities intermittently, typically as a secondary or temporary solution. This group, often necessity entrepreneurs, may turn to self-employment due to job loss or limited opportunities (Reynolds et al., 2002; Dawson and Henley, 2012). Despite often having higher qualifications, they may not effectively use their education due to a lack of continuity and long-term planning (Hussein and Haj Youssef, 2023). In this they may differ from necessity entrepreneurs who, whilst pushed into self-employment by circumstances, may demonstrate the ability to remain in self-employment.

The personal control theory, which highlights the greater autonomy entrepreneurs have compared to employees, suggests that this autonomy enables them to better utilise their education and skills (Douhan and Van Praag, 2009). Applied to the distinction between sustained and dabbled self-employed, the theory explains why these groups experience different educational returns. Sustained self-employed individuals, or opportunity entrepreneurs, often have a clear vision and more control over their careers, allowing them to strategically apply their skills for maximum economic benefit (Fossen and Buttner, 2013).

Conversely, dabbled self-employed individuals, or necessity entrepreneurs, often enter self-employment under less favourable conditions, limiting their ability to fully leverage their education. Their reactive entry and sporadic business activities may hinder the application of advanced skills acquired through formal education (Block and Wagner, 2010), leading to lower educational returns compared to sustained entrepreneurs (Block and Sandner, 2009). Recognising these differences has important implications for economic policy and educational

planning. Policymakers can design targeted support, such as educational programs and business services, to help necessity entrepreneurs transition into opportunity entrepreneurs, enhancing their skill utilisation and economic outcomes (Fossen and Buttner, 2013).

It is also essential to consider broader economic factors, such as recessions or technological shifts, which disproportionately affect necessity entrepreneurs who may lack the resources to adapt quickly. Support mechanisms like business development grants or education subsidies could help these individuals achieve sustainable success and higher returns on their educational investments (Reynolds et al., 2002; Dawson and Henley, 2012). investments (Reynolds et al., 2002; Dawson and Henley, 2012).

Extending personal control theory to self-employment, particularly dabbled self-employed individuals, highlights that their shorter tenures can impede the full development of business ideas and skill utilisation. The intermittent nature of their self-employment often prevents business strategies from maturing and limits returns on human capital (Douhan and Van Praag, 2009). Dabblers tend to oscillate between self-employment and paid work, reflecting a pattern typical of necessity entrepreneurs, driven by factors such as layoffs or limited employment opportunities (Block and Wagner, 2010). This sporadic engagement hinders their ability to consistently apply their formal education (Fossen and Buttner, 2013). In contrast, sustained self-employed individuals benefit from longer tenures, allowing for meticulous planning, stronger networks, and better strategic business development, essential for long-term success (Block and Sandner, 2009). These individuals, akin to opportunity entrepreneurs, proactively enter self-employment to capitalise on business opportunities and maximise autonomy (Fossen and Buttner, 2013). Based on these insights, we propose the following hypotheses to explore educational returns and earnings outcomes across different types of self-employment:

- Hypothesis 1: Sustained self-employed individuals will experience higher returns on their human capital compared to traditional wage earners, owing to their extended tenure in self-employment and greater autonomy in their work. This hypothesis underscores the benefits of sustained entrepreneurial activities, which allow for the continuous application and enhancement of acquired skills (Douhan and Van Praag, 2009).
- Hypothesis 2: Sustained self-employed individuals are expected to have higher returns on their human capital than dabbled self-employed due to their more stable and prolonged engagement in entrepreneurial activities. This stability facilitates the accumulation and effective utilization of human capital, leading to potentially higher economic returns (Block and Wagner, 2010).
- Hypothesis 3: Dabbled self-employed individuals are likely to have lower returns on their human capital than wage earners, as their intermittent engagement in self-employment may limit the full utilization and development of their skills and business ventures. The frequent transitions between different employment states can disrupt the continuity necessary for achieving substantial economic benefits from self-employment (Fossen and Buttner, 2013).

## **Data**

### *BHPS and UKHLS*

Our study utilises data from the British Household Panel Survey (BHPS) and its successor, the United Kingdom Longitudinal Study (UKHLS), covering the years 1991 to 2022. These datasets, interviewing over 5,500 households and 10,000 individuals annually, are representative of the UK population. They provide comprehensive national insights valuable for both policymakers and the academic community. Their reliability and relevance have been previously established in labour economics and other fields (Marè, 2006), making them

suitable for our analysis of the different employment types in the UK. This research uses publicly available data from the British Household Panel Survey and UK Longitudinal Study complies with ethical guidelines for secondary data analysis. The University of Essex Ethics Committee approved data collection for Understanding Society, including data linkages, while health record linkage and biosocial data collection received approval from relevant NRES committees (References: 08/H0604/124, 08/H0720/60, 11/SC/0274, 10/H0604/2).

### *Earnings Variable*

The dependent variable is the reported earnings of both paid employees and self-employed respondents. Aligning with standard practices, we limit our analysis to active workforce participants, excluding individuals under 16 years of age. Self-employed workers are identified based on their primary working activity being self-employment, with wage earners defined similarly. Due to the inherent differences in income structures between paid and self-employed work, a direct hourly wage comparison isn't straightforward. For self-employed individuals, net profit is typically the benchmark for income measurement. To harmonise the earnings data across both groups, we combine self-employed profits with their average monthly business earnings, standardising this composite pay variable. All earnings data are adjusted for inflation, using the year 2000 as the base, and transformed into real pay values. Consistent with established methodologies, we analyse the natural logarithm of hourly gross pay as our primary dependent variable.

### *Education Variable*

The primary explanatory variable is education, quantified as the total years of schooling. Additionally, we incorporate labour market experience, calculated as potential experience, to represent the human capital accumulation of workers. To account for both the acquisition and potential depreciation of human capital, we monitor the frequency of workers' periods of unemployment or inactivity. Our analysis also includes key demographic and socio-economic

factors that might influence earnings. These include age (and its square to capture non-linear effects), gender, ethnicity, origin, marital status, whether the partner is working, the presence and responsibility for children under 16, disability status, English language proficiency, parents' employment background (paid workers or self-employed), total household monthly income, and total weekly work hours. This comprehensive approach allows us to evaluate the diverse factors affecting earnings in the context of self-employment versus wage employment.

### *Dabblers and sustainers*

The division of self-employed into Dabblers and Sustainers was first explored in Hussein and Haj Youssef (2023). The approach uses the panel nature of the BHPS/UKHLS to track respondents over time and so forms a clearer picture of the behaviour within the labour market and transition between waged and self-employment than previous divisions that based their definition only on respondent recent labour market behaviour. The three categories are determined by the span of time that individuals are observed in the sample, how frequently they are observed in their current state of employment and the proportions of time that they spend in self- and paid employment. To ensure that we observe each person for enough waves of the survey to infer a clear idea of their occupational choices we discard any individuals who respond to less than 8 waves (one third of the 23 that we observe). We also exclude anyone with more than two periods of inactivity or unemployment. With this restricted sample we define dabblers as those who spend more than zero but less than 55% of their observed employment time in self-employment. Sustained self-employment covered those who are observed spending 55% or more of their total employment time as self-employed. Finally, the always employed are those that report spending 100% of their total employment time in paid employment. These definitions ensure that every individual in our dataset is either a dabbler, sustainer or always employed. Table 1 outlines the differences between the three: dabbled self-employed (635 individuals), sustained self-employed (1,029), and always paid employees

(4,908). A notable finding is that self-employed workers in our sample, on average, earn more than those always in paid employment, a difference that is statistically significant. Among the self-employed, dabblers tend to earn slightly more than sustainers on average, though this difference is not statistically different from zero. Statistically dabblers and sustainers have the same level of education at just over 13 years. Overall, the self-employed have more education than the always employed in our sample another difference that is statistically significant. Sustainers, dabblers and the always Employed differ along many of the variables outlined in Table 1 with notable difference in age and gender. This preliminary analysis hints at the complex relationship between types of employment, earnings, and educational attainment within our sample.

*Insert table 1 about here.*

Table 1 Summary statistics across employment category.

	Sustainers		Dabblers		Always Employed		Sust. – Dabb.	Sust. - A.E.	Dabb. – A.E.
Hourly pay	13.25	(15.06)	13.02	(10.16)	12.08	(39.68)	0.24	1.17**	0.93***
Years of education	13.10	(2.82)	13.07	(2.76)	12.80	(2.60)	0.03	0.30***	0.27***
Age	44.94	(10.48)	41.02	(10.80)	41.06	(10.97)	3.92***	3.88***	-0.04
Female	0.20	(0.40)	0.32	(0.47)	0.50	(0.50)	-0.13***	-0.30***	-0.17***
Has partner	0.81	(0.39)	0.81	(0.40)	0.77	(0.42)	0.01	0.04***	0.03***
Full-time	0.86	(0.35)	0.86	(0.34)	0.83	(0.37)	-0.01	0.03***	0.03***
Second job	0.11	(0.31)	0.12	(0.33)	0.07	(0.26)	-0.01***	0.03***	0.05***
Children	0.42	(0.49)	0.44	(0.50)	0.41	(0.49)	-0.02***	0.01	0.03***
Children below 16	0.08	(0.27)	0.15	(0.35)	0.21	(0.40)	-0.07***	-0.12***	-0.06***
Disabled	0.04	(0.20)	0.04	(0.19)	0.05	(0.22)	0.00	-0.01***	-0.01***
Migrant	0.07	(0.25)	0.05	(0.23)	0.03	(0.18)	0.01***	0.03***	0.02***
English 1st language	0.94	(0.25)	0.97	(0.16)	0.97	(0.17)	-0.04***	-0.03***	0.00**
Ethnic minority	0.04	(0.19)	0.03	(0.17)	0.02	(0.14)	0.01***	0.02***	0.01***
Person-Year obs.	5167	13883	69778	-	-	-	-	-	-
Individual workers	635	1029	4908	-	-	-	-	-	-

Notes: Means are reported in first columns, standard deviation reported in parathesis. Difference in means ttest significance reported: \*:  $p < 0.1$ , \*\*:  $p < 0.05$ , \*\*\*:  $p < 0.01$ .

## Methodology

To draw out these differences more robustly we use Mincer's (1974) semi-log earning function to estimate the earnings returns to years of education for Hussein and Haj Youssef (2023)) division of worker. We use the following specification<sup>1</sup>:

$$W_{it} = \beta_0 + \beta_1 f(educ_{it}) + \beta_2 f(educ_{it}) * sust_{it} + \beta_3 f(educ_{it}) * dabb_{it} + \beta_4 sust_{it} + \beta_5 dabb_{it} + \beta_c' X_{it} + \beta_\lambda \lambda_{it} + c_i + \epsilon_{it}. (1)$$

Where  $W_{it}$  is the natural logarithm of the deflated gross hourly wage for individual  $i$  at period  $t$ .  $f(educ_{it})$  a function of the continuous variable of years of education. Inspection of the data suggests a non-linear relationship between years of education and the log hourly wage particularly across the different type of employment. We assessed the fit of several models and found a quadratic functional form to be the best-fitting. To estimate the differential impact of education across dabblers and sustainers we interact this function with indicator variables for these types:  $dabb_{it}$  and  $sust_{it}$  respectively. Any differences are measured against the baseline of those in continual paid employment – the always employed.

We control for the observed variables described above with the vector  $X_{it}$ .  $c_i$  is a time invariant person-specific effect which includes unobserved ability:  $\epsilon_{it}$  is the unobserved error term.

A key methodological challenge in our study of education returns is the issue of self-selection into our sample. We include individuals who report wages from either employment or self-employment and are aged 16 or above. However, to maintain the focus of our analysis on market-driven earnings, we exclude individuals currently in education, vocational training, military or community service, farmers, retired workers, and civil servants. These groups are not primarily engaged in the labour market, and their earnings are less influenced by market factors. Additionally, family members assisting in family businesses are excluded as they do

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<sup>1</sup> As used by Harmon, Walker, and Westergaard-Nielson (2001, pp 3-5); Heckman et al. (2003); Borjas (2013) p:277; Fossen and Buttner (2013, p. 73)

not represent primary self-employed individuals, given they didn't initiate these businesses themselves (Haj Youssef et al., 2024). This approach helps mitigate self-selection bias - the phenomenon where individuals choose jobs best suited to their skills and preferences, leading to non-random work choices and potentially biased estimates (Card, 1999; Harmon, Oosterbeek and Walker, 2003; Shane, 2006; Dickson and Harmon, 2011). Addressing this bias is crucial for ensuring the accuracy and validity of our findings regarding the returns from education across different employment types.

A potential risk in our analysis is that the data is a non-random cross-section of the population. This is common issue in the returns from education literature and is recognised to introduce bias. For instance, individuals with schooling who are not currently working are excluded from our observation, thus their educational returns remain unaccounted for (Puhani, 2000). Such a risk can be accounted for econometrically if this selection is driven by observable factors or innate unchangeable individual characteristics. However, the drivers of selection into and out of employment are often complex and not easily identified or observed (Winship and Mare, 1992). To mitigate this issue, we implement the standard Heckman selection model (1974, 1978), which treats selection bias as if it were an omitted variable. A first step estimates participation based on the control variable outlined above for each wave of the data. From these we estimate an additional regressor - the inverse Mills ratio ( $\lambda_{it}$ ) – which is included in our main specification to account for the self-selection bias following Puhani's (2000) standard procedure.

For our initial analysis, we employ an Ordinary Least Squares (OLS) model, which is the predominant method for analysing the Mincerian equation in earnings studies (Card, 2001). To address serial correlation and heteroscedasticity inherent in panel data, we use panel-robust standard errors and cluster our analysis at the individual level. Our panel data analysis involves controlling for unobserved fixed individual characteristics using both Random Effects (RE).

The RE model, a variation of the pooled OLS model, incorporates the intercept into the error term, allowing for a regression with a composite error term. This model assumes no correlation between the error term and explanatory variables for the same individual (Cameron and Trivedi, 2009). If this assumption is met, then it helps account for a common concern in the education return literature - the role that unobservable individual ability plays in influencing wages. In the literature this factor is usually controlled for using a fixed effects model which has less restrictive assumptions than random effect. This approach accounts for unobserved heterogeneity by transforming individual observations into deviations from the average, thus eliminating time-invariant characteristics from the equation. However, this model has limitations, including the inability to control for time-varying unobserved factors and the exclusion of time-invariant observable characteristics like race, gender, and ethnicity (Cameron and Trivedi, 2009; Fossen and Buttner, 2013). Unfortunately, as our two main variables of interest – years of educations and category of self-employment – are fixed over time we are unable to use this approach and so focus on the Random Effects model.

A central challenge in exploring the impact of education on self-employment outcomes is the endogeneity issue: the potential correlation between an individual's years of education and unmeasured factors affecting their income. This correlation might introduce biases in our analysis. Traditional methods like fixed effects regression account for constant individual characteristics but struggle with changing unobserved factors that simultaneously affect income and educational decisions. Moreover, there's a possibility of reverse causality, where higher income might encourage further education, particularly in mid-career professionals seeking skill enhancement. Acknowledging these complexities, the usual approach in the literature incorporates an Instrumental Variable (IV) method. This involves using an external factor –parental education in the standard model (e.g., Hoogerhei, Block and Thurik, 2012; Fossen and Buttner, 2013) – that presumably impacts educational attainment without directly

influencing income. This choice is rooted in existing literature and supported by studies indicating a strong parental influence on children's educational success (OECD, 2014; Dickson, Gregg, and Robinson, 2016). In our study, data on fathers' education is somewhat limited. We lack detailed information about the age at which fathers completed their full-time education and the specific qualifications they obtained. An option would be to create binary indicator to denote whether fathers had any formal qualifications, encompassing schooling, further education, or university degrees. This approach, however, introduces analytical challenges due to its time-invariant nature. In a fixed effects model, such a time-invariant instrument would be excluded, limiting its applicability. Given the absence of a dynamic, time-varying instrument any analysis would be limited. For this reason, we focus solely on the random effect model. Whilst there are limits in this approach it allows for a strong exploratory analysis on the variation of return from educations across this novel division of the labour market.

## **Results**

Table 2 presents the findings across different models used in our study. We present results both for pooled OLS and Random Effects. The results of a Breusch and Pagan Lagrangian multiplier test indicated that the Random Effects approach is the more appropriate, so our analysis focuses on this model.

The trends observed for various control variables align with prior research and are consistent across different analytical approaches. We found that the gender of respondents plays a notable role in earnings, with women estimated to earn approximately 17% less than men. Those with a partner earn more on average. Regarding family dynamics, adults with children generally see higher returns, but this trend reverses for those with children under 16. Disability is associated with a downward pressure on wages. When individual level unobserved characteristics are accounted for full-time workers appears to earn a lower hourly wage than part-time workers. Being a non-native worker does not appear to impact wages in

our study although proficiency in English is associated with a 10% increase in earnings. Ethnic background appears to significantly affect earnings in our study but only when unobserved individual level characteristics are accounted for.

*Insert table2 about here.*

Table 2 Log hourly pay regressions.

	OLS		Random Effects	
Years of education	0.263***	(0.024)	0.332***	(0.023)
Years of education squared	-0.007***	(0.001)	-0.009***	(0.001)
Sustainers	1.575**	(0.729)	1.699**	(0.680)
X Years of education	-0.270**	(0.109)	-0.293***	(0.100)
X Years of education squared	0.010**	(0.004)	0.010***	(0.004)
Dabblers	0.750*	(0.411)	1.372***	(0.456)
X Years of education	-0.109*	(0.060)	-0.195***	(0.066)
X Years of education squared	0.004*	(0.002)	0.007***	(0.002)
Age	0.055***	(0.002)	0.070***	(0.002)
Age squared	-0.001***	(0.000)	-0.001***	(0.000)
Female	-0.137***	(0.011)	-0.167***	(0.011)
Partner	0.043***	(0.010)	0.037***	(0.007)
Full-time	0.087***	(0.011)	-0.075***	(0.009)
Second job	-0.039***	(0.012)	-0.041***	(0.008)
Children	0.072***	(0.010)	0.039***	(0.007)
Children below 16	-0.076***	(0.014)	-0.103***	(0.010)
Disabled	-0.020	(0.013)	-0.015**	(0.008)
Migrant	-0.034	(0.032)	-0.049	(0.031)
English first language	0.108***	(0.033)	0.107***	(0.033)
Ethnic minority	0.036	(0.042)	0.069**	(0.035)
Inverse Mill Ratio	0.187***	(0.015)	0.026***	(0.010)
Constant	-1.161***	(0.169)	-1.963***	(0.162)
N		88828		88828
r2		0.222		0.193

Notes: \* p < 0.10, \*\* p < 0.05, \*\*\* p < 0.01. Robust standard errors are clustered at the individual level. Inverse Mills Ratio is the selection correction term.

A key aspect of our study is understanding how individuals select their occupations, particularly in relation to their educational background and potential earnings. The inverse Mills ratio is included as a control variable to account for workers in our selecting into working population in a non-random manner. For both specifications the significant positive estimates indicate a tendency for individuals to select into observations based on unobservable factors. In the Random Effects regression where we use the panel nature of the dataset to account for individual characteristics the estimate is much reduced in size and is close to zero suggest the model correctly account for these selection effects. In doing so this allows us to more precisely estimate how education is associated with the workers' decisions to select into and out of self-employed – to dabbler or sustain.

*Insert figure 1 about here.*

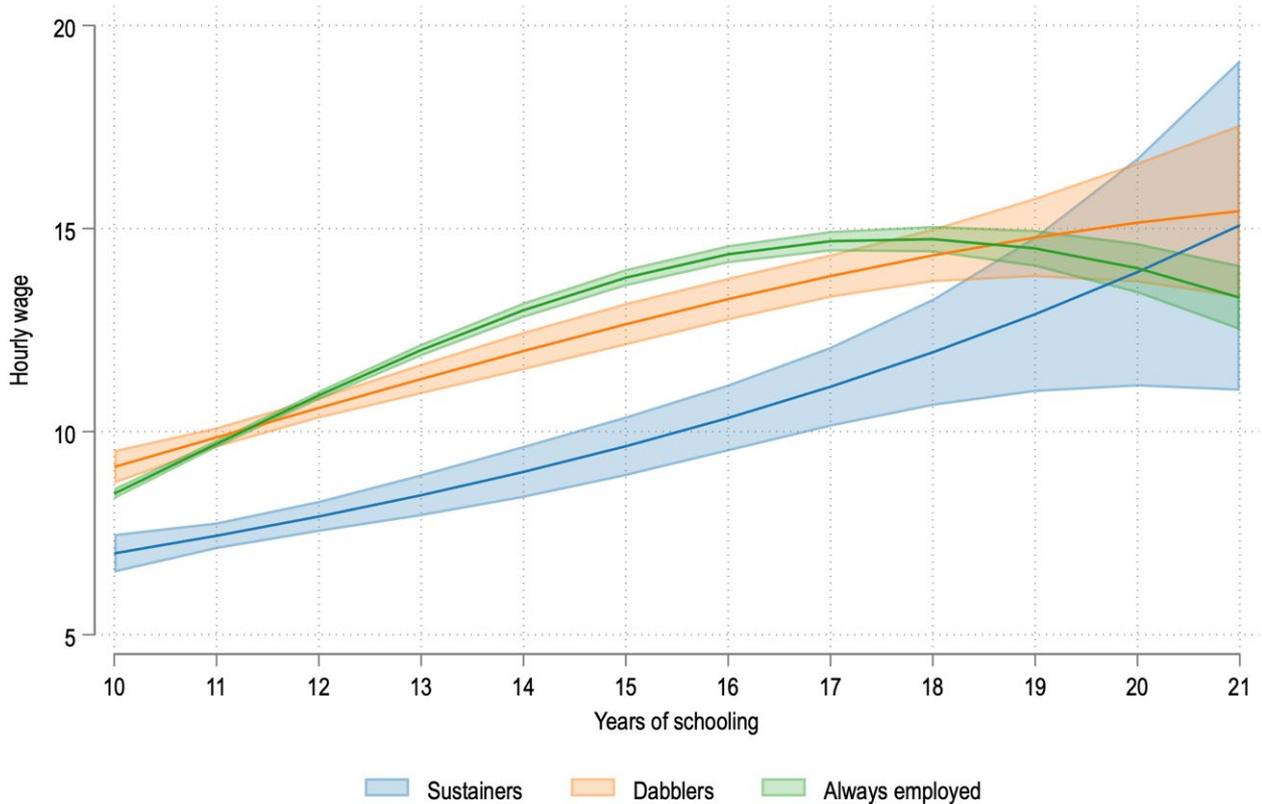


Figure 1 Predicted hourly wage from Random Effects model.

Notes: Figures is based on the estimated coefficients of the Random Effects model. All variables except years of schooling and employment type are held at their sample means. Outcome variable is predicted as hourly wage. Shaded areas show the 90% confidence interval.

We now focus on the results of our main analysis. The functional form of our model prevents clear cut acceptance or rejection of our hypotheses for all workers. Rather than producing general linear trends on returns from education for each category of worker we find interesting divergences and convergences based on employment type and level of education.

To examine this, we look at our estimates of years of education and its square and their interaction with Dabbler/Sustainer status. The parameters without interactions represent the relationship between years of education and log wage for the always employed. Looking at column two and the Random Effects results it appears there is a concave relationship with yearly returns from education being positive up to 17.7 years of study. At this point – beyond standard higher education – the returns turn negative. This suggests that for most workers in

permanent waged employment (over 97% of the sample) the marginal effect of an extra year of education is positive.

Turning to the self-employed we see that both Dabblers and Sustainers differ from the always employed in their returns from education. For both categories the interaction with the linear and quadratic terms of years of education are jointly significant at the 99% confidence level. The interaction with the linear term both is negative whilst the interaction with the quadratic terms is positive. For sustainers these results indicate that the returns from education are less than those for the always employed for the first 14.1 years of education. Whilst an extra year of education has a positive association with wage it is less for sustainers than the always employed. After this threshold an extra year of education begins to benefit sustainers more. There is a similar relationship for Dabblers with the crossover point higher at 14.9 years. This suggests that for the entire period of formal schooling within the UK – both primary and secondary – an extra year of education is associated with a smaller increase in wages compared to the always employed. This suggests that wages diverge during this period before beginning to converge.

Quadratic specifications do not provide as easily interpretable results of a linear model so will rely on a visual model to assess the impact of the results on our hypotheses. In Figure 2 we plot the relationship between the hourly wage and the years of education. This is based on the estimated coefficients of the Random Effects model. All variables except years of education are held at their sample means. We also convert the predicted dependent variable back to hourly pay for ease of interpretation. 90% confidence interval are plotted in the shaded areas.

We can immediately see the precisely estimated concave relationship for the always employed described above. For Dabblers we see a curvi-linear relationship within the time period of our sample. As years of education increases the hourly wage increases. It appears the

rate of returns from education is diminishing with the relationship less precisely estimated at the higher level of education where negative returns may be possible. For sustainers, on average wages rise with education at an increasing rate although again there is some imprecision for those who remain in education the longest.

We now look at the relationship between the wages for the always employed and sustainers to see what evidence they provide for Hypothesis 1. At lower levels of education, we see the wage gap increase in the always employed's favour. This is mostly driven by the higher returns from education for those in paid employment. This gap reaches its maximum at about 15 years of education which on average aligns with the first year of higher education. After this the gap narrows to zero and at the mean sustainers start earning more than the always employed after 20 years of education. This narrowing is driven both by the negative returns from education for the always employed and the increasing returns for the sustainers. This nuanced result gives partial confirmation for Hypothesis 1 for those sustainers with a higher than secondary education. For them each extra year of education has a higher marginal benefit in terms of hourly wage in comparison to the always employed.

In Hypothesis 2 we predicted that the sustained self-employed would have higher returns than dabblers. We can see that as the years of education stack up the wage gap between the two types of self-employed narrows. This narrowing begins at around 12 and a half years of education. Beyond this point each year of education provides higher returns to the sustained self-employed compared to the dabblers. Post-regression tests confirm that this difference is statistically significant at the 99% confidence level. Therefore, for those with education up to at least late secondary school onwards we find strong evidence to support Hypothesis 2.

Finally, Hypothesis 3 predicts that the dabbled self-employed will have lower returns from education than the always employed. Again, we see that there is evidence for such a claim within a certain range of schooling. For those who are always employed and have below 17

years of schooling – on average up to the middle of higher education – see their wages increase with each extra year of education at a higher rate than that of dabblers. In other words, the returns from educations are lower for dabblers in this section of our sample (93% of the total). As we move into post-graduate levels of education this story reverses as the negative returns for the always employed kick in whilst the returns for dabblers remain positive.

## **Discussion and Conclusion**

This paper builds upon previous research examining the educational returns among self-employed individuals, such as the studies of Block and Wagner (2010) and Fossen and Buttner (2013), focusing on different types of entrepreneurs. Our study specifically draws upon the categorisation by Hussein and Haj Youssef (2023) of self-employed individuals as 'sustainers' and 'dabblers', and the personal control theory. This study is particularly timely given the increasing prevalence of self-employment and gig economy jobs, where understanding the returns from education in these non-traditional employment forms is critical for informing educational and labour market policies. By focusing on the UK context and utilising robust longitudinal data, our research provides a solid empirical foundation for policymakers aiming to support diverse employment pathways through targeted educational investments and labour market interventions.

### *Theoretical Implications*

Our study makes several contributions to the broader discourse on the value of education in the labour market, particularly in the context of self-employment. It emphasises the importance of understanding how educational investments translate into tangible career benefits, a key consideration for educators, policymakers, and learners. By distinguishing between different categories of self-employed individuals—sustainers and dabblers—our research provides a nuanced understanding of the heterogeneous nature of self-employment and its interaction with educational attainment.

One of the central theoretical contributions of our study is the extension of personal control theory within the context of self-employment. Personal control theory posits that the autonomy and control inherent in self-employment can lead to higher job satisfaction and potentially greater returns on education (Van Praag & Versloot, 2007). Our findings support this theory, showing that sustainers, who have prolonged engagement in self-employment, benefit from higher returns from education compared dabblers. This is likely due to their ability to strategically apply their knowledge and skills over a longer period, thereby maximising the economic returns of their educational investments. This extension of personal control theory underscores the differential impact of educational attainment based on the stability and duration of self-employment.

Our research highlights the heterogeneity within the self-employed sector, challenging the traditional view that treats self-employed individuals as a homogenous group. By categorising self-employed individuals into sustainers and dabblers, we reveal significant differences in their educational returns. Sustainers, who consistently engage in self-employment, exhibit a more substantial application of their skills and education, leading to higher returns. In contrast, dabblers, who transition between self-employment and wage employment, experience lower returns due to the intermittent nature of their engagement. This distinction is crucial for developing targeted policies and interventions that address the specific needs and challenges of each group.

Methodologically, we focus on the Random Effect model for a strong exploratory analysis on the variation of return from education across our division of workers accounting for unobserved individual level characteristics and for self-selection bias. Self-selection bias occurs because individuals choose occupations based on personal characteristics that also affect their earnings. By leveraging the panel nature of the BHPS and UKHLS datasets and applying the Heckman selection model, we correct for potential biases (Heckman, 1979). These

methodological advancements ensure more accurate and reliable estimates of the returns from education, contributing to the robustness of empirical research in this field.

Our findings also contribute to the broader understanding of human capital theory, which suggests that investments in education and training enhance productivity and earnings (Becker, 1962; Schultz, 1963). While the theory generally posits positive returns from education, our study highlights the variability of these returns based on employment type and stability. The differential returns observed between sustainers, dabblers, and always employees indicate that the context in which education is utilised significantly influences its economic benefits. This variability underscores the need to consider employment stability and the nature of job roles when applying human capital theory to different labour market segments.

#### *Practical Implications*

Our findings reveal the complex interplay between skills, experience, and educational returns. Dabblers, due to their involvement in both self-employment and traditional employment, develop a mix of technical and soft skills. Their experience in setting up businesses equips them with entrepreneurial skills, while their time as employees helps them acquire industry-specific technical skills. This diverse skill set allows dabblers to navigate various job roles, although they may not reach the peak efficiency or specialisation seen in sustained self-employed individuals or always employees.

Sustained self-employed individuals with lower years of schooling might lack certain soft skills, which can limit their returns compared to those with a broader set of skills. Their specialised, niche skills may not be as transferable across different industries or job roles, unlike the more generalisable skills of always employees. For always employees, the consistency in their work allows them to benefit more from experience and learning curve effects, leading to higher efficiency. This consistency enables them to develop transferable skills that are highly valued across employers and industries. To address this issue, policy

initiatives should focus on providing sustained self-employed individuals with opportunities to develop soft skills and more transferable competencies. This could include workshops, mentoring programs, and networking opportunities that emphasise communication, leadership, and adaptability. By broadening their skillset, sustained self-employed individuals can enhance their ability to adapt to changing market conditions and explore new business opportunities.

Dabblers, on the other hand, face the challenge of transitioning between self-employment and wage employment. This transition prevents them from reaching the peak returns associated with either consistent self-employment or continuous wage employment. However, their hybrid skillset, while not as highly valued as fully transferable skills of employees, is still more advantageous than the highly specialised skills of sustained self-employed individuals. This nuanced understanding of skill development and its impact on educational returns provides valuable insights for developing targeted educational strategies. Given the hybrid skillset of dabblers, policy measures should focus on enhancing both their entrepreneurial and industry-specific skills. Government and educational institutions could develop training programs tailored to support dabblers in their dual roles. For example, vocational training and continuing education programs that combine entrepreneurial skills with industry-specific knowledge could help dabblers maximise their returns from education. This approach would ensure that dabblers can effectively leverage their diverse skillset across different employment contexts, thereby improving their employability and earnings potential.

To replicate this study in other parts of the world, researchers should consider several adaptations. First, it is essential to utilise nationally representative longitudinal datasets like BHPS and UKHLS. Additionally, the categorisation of self-employed individuals should be adapted to reflect the local economic and cultural context. For instance, in India, the large informal sector might necessitate distinguishing between formal and informal self-employment. Researchers must also consider the different educational systems and skill

development programmes in these countries. It is crucial to account for varying levels of formal and informal education and training, which can influence the returns from education. Moreover, the unique economic challenges and opportunities in these regions must be factored in. In countries with high under-employment, the dynamics between education and employment might differ significantly from those in the UK. To ensure the robustness of the findings, the econometric models used should account for country-specific biases and selection effects. The Heckman selection model and Random Effect Method should be adapted to fit the local data availability and quality. By incorporating these adaptations, researchers can effectively explore the returns from education among self-employed individuals in different global contexts, providing valuable insights into how educational investments impact career trajectories in diverse economic environments.

### *Conclusion*

Our study provides a comprehensive analysis of the returns from education among different types of workers, with a particular focus on the self-employed. By categorising workers into sustainers, dabblers, and always employees, we have highlighted the nuanced ways in which education impacts earnings across these groups. The findings suggest that while self-employed sustainers and always employees benefit significantly from their educational investments, dabblers face unique challenges that may limit their returns from education, especially for those with a certain range of years of schooling (primary and secondary levels of education). These insights are crucial for developing targeted educational programmes and policies that support diverse career pathways, particularly in the context of work-based learning. Our work highlights the necessity for tailored, flexible, and industry-relevant educational strategies. Customised apprenticeships and internships can integrate practical experience with formal education, benefiting both dabblers and sustained self-employed individuals by enhancing their diverse skill sets. Recognition of prior learning can formalise skills acquired through varied

work experiences, while blended learning approaches offer flexibility to balance education with professional demands. Mentoring and networking opportunities are essential for providing guidance and fostering collaborative growth. Emphasising lifelong learning and continuous professional development ensures skills remain relevant, and sector-specific training programmes can address unique industry needs. Effective work-based learning requires robust policy support and collaboration between educational institutions, industry stakeholders, and government bodies to align curricula with market demands, ultimately fostering a skilled and adaptable workforce. Future research should continue to explore these dynamics in other contexts and extend the analysis to understand better the long-term career trajectories and educational outcomes of different worker categories.

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