Flows in and out of self-employment

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Executive Summary

The establishment and growth of new businesses are key ingredients for economic growth and job creation across economies. As such, a key objective for policy makers is targeting institutional and policy objectives that encourage entrepreneurship. However, not all new firms create additional employment or add to the productive capacity of the economy. In that sense, understanding selection into entrepreneurship (and exit) can provide valuable insight for policymakers; and understanding differences in the type of entry and exit at different points of the business cycle can help to better understand policy in the context of both ex-ante and ex-post interventions.

The literature on entrepreneurship distinguishes between types of entrepreneurs and their drivers; namely those motivated by 'necessity' or 'opportunity'. A key differentiating characteristic is how each are correlated with broader economic cycles, i.e. necessity entrepreneurship is more likely to occur as other options for employment diminish rather than expand and create businesses when they see an opportunity. For this reason, we study how the type of entry and exit changes over the cycle.

The share of self-employed workers of the labour force in Ireland generally trended downward from the late 1990s, but this trend paused in the post-GFC period with changing composition of these entrants and exitors of self-employment a significant factor. The compositional shift reflected a greater share of self-employment arriving from unemployed status compared to pre-crisis. While also of note is a larger share of self-employed workers exiting to unemployment. This suggests that in this post-GFC period an increased number of self-employed are working on the margins, focused on survival as opposed to further job creation.

To examine this further, we use employment status information from the Labour Force Survey to examine how transitions into and out of self-employment vary across the business cycle and across individual characteristics. Being unemployed is found to have a strong influence on self-employment entry, with this being larger for self-employed without employees, a proxy for necessity entrepreneurship. This influence increased in the crisis and post-crisis periods, suggesting that necessity dynamics are more substantial in low points of the business cycle. Necessity entrepreneurs also appear more likely to exit from self-employment. This suggests that in recessionary periods, any increase in the self-employment entry rate is likely to be temporary in nature and will not lead to boosts in further employment. At the same time, the relationship between necessity entry and unemployment did not fully unwind post-crisis which may have implications for future productivity growth. Meanwhile, entry during the pandemic period was largely unexplained by all observed characteristics, which may in part be due to increased remote working opportunities during this period.

Whilst these results are descriptive in nature, they are useful not only for the study of entrepreneurship but also for understanding the role of self-employment in the economy. The fact that self-employment provides a form of insurance for less educated and lower income workers suggests that policies which make it more expensive to start and operate a business will tend to increase unemployment in downturns. On the other hand, these policies should be focused on certain types of individuals in order to reduce business failure and improve the quality of entrepreneurship.

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Section 1: Introduction[1]

The central role of entrepreneurship in driving economic growth has long been acknowledged in theories of economic growth and business cycles. Most famously, Schumpeter (1942) described the transformative role that entrepreneurs play by increasing competition and shaping markets through the provision of new goods, services and ideas to the economy. On business cycles, Fisher (1933), Keynes (1936), Bernanke and Gertler (1989), Caballero and Hammour (1994) and others explain that the response of entrepreneurs to aggregate shocks shapes how those shocks propagate through the economy. While a rich body of research explores selection into entrepreneurship, less attention is paid to the heterogeneity amongst these agents and how it can vary at different points in the economic cycle. In reality, most firms are small and few grow substantially, suggesting that not all entrepreneurs are drivers of growth (Haltiwanger et al., 2013).

Previous research on the relationship between the economic cycle and entrepreneurship provides mixed results with studies showing positive relationships, negative relationships, and zero relationships (Parker, 2009). In the US and the UK, for instance, the entrepreneurship rate was higher during the "Great Recession" than it had been during the period of strong economic growth throughout the 1990s (Blanchflower, 2000; Bell and Blanchflower, 2011). One potential reason for this ambiguous relationship is that there are two underlying components to business creation: one that is pro-cyclical and one that is counter-cyclical. Indeed, one strand of entrepreneurship research has differentiated between the two different motivations for starting a business: "opportunity" entrepreneurship and "necessity" entrepreneurship (Fairlie and Fossen, 2018). The basic distinction is that some entrepreneurs create businesses when they see a business opportunity whereas other entrepreneurs are forced into starting a business out of necessity due to a lack of options in the labour market.

This distinction has been highlighted as particularly important in terms of how self-employment is correlated with broader economic cycles. How much of an elevated entry rate in a recession can be explained by the higher unemployment rate, with more individuals having fewer options and therefore a higher propensity to set up a business? Alternatively, individual characteristics may have very different relationships with self-employment entry and exit during a recession when compared to a boom period. Therefore, we ask what characteristics, including the previous labour market status, are associated with the entry and exit of new entrepreneurs and how does this vary across the business cycle? To capture the different motivations for entry we investigate this separately for the self-employed who have employees and those who do not, using employment of others as an alternative, albeit somewhat crude, proxy for entrepreneurship motivated by opportunity.

Understanding this occupational choice is important, as aggregate productivity depends on who becomes an entrepreneur. In addition, many countries, including Ireland, have programs promoting entrepreneurship and/or treat small businesses differently. Understanding the effectiveness of these programs and appraising policy interventions requires identifying who becomes an entrepreneur and how different forms of self-employment are likely to be associated with different economic outcomes. For example, although necessity entrepreneurship is likely to be more about creating a single job rather than jobs, this can help smooth out unemployment or underemployment.

To analyse these questions, we use the Irish Labour Force Survey (LFS) to examine how transitions into and out of self-employment vary across the business cycle and across individual characteristics. The LFS is a representative individual-level rotating panel of data which means that we can follow individuals over time and gain insight into the drivers of dynamics within the labour market. Ireland has

historically had a flexible labour force that has had strong responses to the business cycle, with an elastic labour supply providing insulation to the economy when it has been hit by specific shocks (Fitzgerald et al, 1999; Conefrey et al., 2015). Despite this, we do not know much about the self-employed component of the Irish labour force and how the composition of this has changed over time.

Another value-added of the paper is the inclusion of self-employment entry and exit during the pandemic period, during which large supports were offered to workers and businesses in Ireland. The increase in support to prevent firms shutting down may have been spent inefficiently if an unintended side-effect was to make it more challenging to attract firm entry or workers back into the labour force (Belitski et al., 2022). It may also have had a dampening impact on the self-employment entry and exit rates, as well as the altering the composition of those who chose to enter.

We initially detect a pro-cyclical relationship between growth in the domestic economy and movement both into *and* out of self-employment. However, we show that this depends on the type of transition; movements to and from waged employment are pro-cyclical, while movement from unemployment to self-employment is reduced when the labour market is performing well. Probit estimations show that being previously unemployed has a strong influence on entry, with this being larger for those without employees. Across different time periods, we find that the probability of entering self-employment from unemployment increased in the crisis and post-crisis period, with the difference in the probability increase being much larger for entrants without employees. This suggests that necessity dynamics are more substantial in low points of the business cycle.

Finally, being a self-employed worker who has employees also reduces the probability that an individual will be observed to exit in the sample, indicating that it is mainly the necessity entrepreneurs who exit the labour market. This suggests that in recessionary periods, any increase in the self-employment entry rate is likely to be temporary in nature and will not lead to boosts in further employment. These necessity entrepreneurs may, however, play an important economic role by helping to maintain worker skills during economic downturns and so minimising the long-term scarring effects of large—scale unemployment on productivity. The income gained from self-employment may also supplement fiscal stabilisers such as unemployment benefits in shielding consumption during a downturn.

The paper is structured as follows: The next section outlines a theoretical framework of self-employment entry and a review of the most relevant empirical literature. Section 3 describes the data, with Section 4 providing an overview of the methods used. Section 5 outlines empirical results, while Section 6 summarises the results and draws out some implications for policy.

Section 2: Theoretical framework and empirical findings

There are a number of reasons for self-employment entry which can be broadly grouped and defined as either necessity or opportunity. Fairlie and Fossen (2018) propose a definition that can be measured empirically and is consistent with theoretical models of the choice to become self-employed, such as Evans and Jovanovic (1989). Individuals can either obtain income from the wage and salary sector:

$$y^w = w + rA$$

Where w is the wage offered on the market, r is interest rate and A represents an individual's assets. Alternatively, they can receive income from self-employment which is defined as:

$$y^{se} = \theta f(k)\varepsilon + r(A - k)$$

where is θ entrepreneurial ability, f(.) is a production function whose only input is capital, ε is a random component to the production process, and k is the amount of capital employed in the business. Individuals choose to become self-employed if the potential earnings from self-employment and investing remaining personal wealth after using it for start-up capital is higher than the potential income from wage and salary work and investing personal wealth.

This simple theoretical model is useful for identifying the two components of business creation. Necessity entrepreneurship is usually considered business creation in the face of limited alternatives. In the model, this would imply that y^w is low or suffered an adverse shock, causing y^{se} to be larger. Given wage reductions are unlikely even in recession (Bewley, 1999), this is best explained by becoming unemployed, thus reducing y^w below y^{se}. For this reason, individuals who enter self-employment from a state of unemployment are defined as necessity entrepreneurs.

On the other hand, opportunity entry is generally thought of as business creation when there is an entrepreneurial opportunity. Several factors could lead to an increase in $\theta f(k)\varepsilon$ and therefore opportunity self-employment. This could be a positive shock to demand (ε), a discovery of an improved method of productivity (increasing $f(k)$ for all k), or a change in entrepreneurial ability. Business cycles can also lead to changes in the availability of entrepreneurial opportunities, in part through changes in demand but also wealth and access to financial capital (Storey 1991; Brunjes and Diez 2013). [2] Opportunity entrepreneurs are defined as those who self-employment from a state other than unemployment.

In this paper, we largely focus our attention on changes over time in flows into and out of self-employment, examining how the overall magnitude of these flows relate to the overall economic cycle and also the extent to which characteristics of the self-employed entry and exit cohorts vary across time periods that reflect substantially different labour market backgrounds. In terms of the theoretical framework, this can be thought of as attempting to isolate variation in the returns to self-employment income relative to employment income. Factors such as entrepreneurial ability (θ) are assumed to have a distribution that does not vary over time and are therefore not explicitly considered further in the analysis. Variation in this parameter across the population has been the focus of a number of studies examining self-selection into self-employment, e.g. Dustmann et al., (2002) and Batista et al., (2017). These have used instrumental variables and/or natural experiments that are not available in the labour force data that we rely on but do point to a rich seam of further research if self-selection was to vary over time, as well as between individuals.

Based on the operational definitions above, Fairlie and Fossen (2018) find that the majority of entrepreneurs in the US and Germany are opportunity entrepreneurs. They also find that necessity based entrepreneurs are mainly counter-cyclical while opportunity based ones are pro-cyclical. Using time series analysis, Congregado et al. (2012) find that employer self-employment rates move in a pro-cyclical manner, while own-account self-employed behave counter-cyclically. We build on this by using

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[2] The converse may also hold true in the case of a recession for these pull and push effects.

panel data to control for different types of self-employed workers' previous labour market status, allowing us to apply these definitions.

Papers that use microdata generally find a positive relationship between unemployment rates and self-employment entry rates, suggesting they are counter-cyclical (Ritsila and Tervo, 2002; Berglann et al. 2011; Astebro et al. 2011; Biehl et al. 2014; Fritsch et al. 2015). Panel microdata studies, which offer the ability to control for the individuals previous and future labour market status, are scarcer. Using the monthly data for the US, Fairlie (2013) finds that higher unemployment rates push individuals into self-employment, which is a sign of necessity entrepreneurship. Fossen (2021) uses the same dataset to show that individual unemployment mostly explains the increase in the self-employment rate during the crisis, with this mainly attributed to those self-employed with unincorporated businesses.

Lin et al., 2000 were among the first to study both entry and exit dynamics, using 14 years of data for Canada. They control for a series of cyclical and non-cyclical factors to explain the entry and exit rates. The unemployment rate has a positive but insignificant influence on entry and exit, nor is there any support for the notion that self-employed leave the business as they are pushed out for economic reasons. Younger workers are more likely to enter and exit, and have a higher turnover in the labour market. Worker experience has an important role in entry decisions, while the duration of self-employed has a negative impact on exit. Finally, having a self-employed spouse increases the chances of an individual also becoming self-employed, possibly as a result of those who set up family businesses.

There is little research analysing self-employment flows in Ireland. Nolan and Barrett (2019) focus on the role of self-employment for individuals at older ages, finding that a higher proportion of the older workforce being self-employed in Ireland is driven by lower retirement rates among the self-employed, rather than more transitions from employment. This research builds on that by analysing the transitions in and out of self-employment for Ireland across the population using a panel of data spanning over 20 years.

Section 3: Methodology

We first estimate probit models of the probability of becoming self-employed separately for different periods; pre-crisis, during the crisis, the recovery years and COVID-19. The binary outcome variable $entry_{i,t+1}$ $(exit_{i,t+1})$ equals 1 if individual i enters into (exits out of) self-employment between quarters t and $t+1$, and 0 otherwise. The latent index function of the probit model is written as

$$entry^*_{i,\,t+1} = X_{it}\beta + \epsilon_{it} \qquad\qquad (1)$$

where $entry^*_i$ $(exit^*_i)$ is the propensity to enter into or exit out of self-employment, X is a vector of explanatory variables including dummy variables indicating an individual's labour market status, β is a coefficient vector including a constant, and is the error term.

To identify the effect *ceteris paribus*, we control for individual characteristics of self-employment identified by the literature (e.g., Parker 2018). We include an individual's highest educational degree obtained, age, gender, marital status, number of children, region of residence, a dummy indicating Irish nationality and a dummy variable indicating whether the respondent is a homeowner. As well as this, we decompose the change in the mean entry probability between periods into a part explained by changes in observed individual variables, including unemployment status and non-participation, and an unexplained part reflected in changes in the coefficients and the intercept. Other relevant variables may still be missed, which would increase the unexplained part in the decomposition analysis. Specifically, we implement an adaption of the decomposition approach originally suggested by Oaxaca (1973) and Blinder (1973); an overview is provided in Fortin et al. (2011).

Section 4: Data

4.1 Representative panel data

We use employment status information from the CSO's Labour Force Survey (LFS) for the period 1998Q1 to 2022Q4 to examine the characteristics of the self-employed and the extent to which the characteristics of becoming self-employed changed against the background of dramatic changes in economic conditions. This is a large survey designed to gather information on labour market issues in Ireland. The design is that of a rotating panel, where individuals are followed for up to five quarters with one-fifth of the sample being replaced (and 'rotating out') in each quarter. This rotating panel feature allows us to examine transitions into self-employment, taking into account prior occupational and sectoral experience as well as other characteristics. The panel dimension of the LFS data also allows us to examine the characteristics of those exiting self-employment.[3]

Self-employment status is commonly used to operationalise entrepreneurship in empirical research. However, as mentioned there is heterogeneity in self-employed and entrepreneurship types. Therefore, we distinguish in the data between self-employed who also have employees and those who do not, with the former more likely to be entrepreneurs who have the goal of growing the business and creating jobs, as opposed to those focused on just creating a job for themselves. This differs from similar research (Levine and Rubinstein, 2017) that focuses on the differences between unincorporated and incorporated businesses.

The panel data structure of the LFS allows us to observe entries into self-employment from one quarter to the next based on questions about the current employment status in two consecutive quarters. Respondents are asked whether were: self-employed with paid employees, self-employed without paid employees, an employee, on an employment scheme or an unpaid family worker. In the estimation sample, we include individuals between the ages of 15 and 74 and exclude unpaid family members, those unable to work, and retirees. For the analysis, we then split the sample into four periods: before the crisis (1998Q1-2007Q4), during the crisis (2008Q1-2012Q4), the recovery years (2013Q1-2019Q4) and the COVID-19 pandemic (2020Q1-2022Q4).[4]

4.2 Self-employment entry and exit across the sample period

Figure 1a shows that the share of self-employed of the total workforce has generally fallen over the sample period, although there was a pause in this decline by the end of the crisis. This is perhaps surprising, given that sectors with significant shares of self-employed persons, such as construction, were most severely impacted by the Global Financial Crisis (GFC) in Ireland. This pause in trend suggests that drivers of those pre-crisis dynamics of entry and exit altered in the years during and immediately after the crisis. Notably, in the later stages of the last decade, the pre-crisis trend for a declining share of overall self-employment resumed as the economy gathered more momentum.

Figure 1b illustrates the self-employed entry and exit rates over the sample period for the whole economy, minus the agricultural sector.[5] The entry rate averages between 2 and 3 per cent over the period, with an upward spike around 2005 before a decline coinciding with the crisis. This was followed by a flat entry rate until 2017 when it sharply increased, followed by a similar spike in 2020, the first year of the pandemic. The exit rate shows a similar pattern, although the increase in 2005 is stronger. These differing entry and exit rates across the business cycle may be partly driven by different motivations to change labour market status, which would change the composition of the self-employed share over the period.

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[3] Table A1 of the appendix shows the demographic profile across a range of employment statuses in the data. Appendix available upon request.

[4] Narrowing the crisis period to 2008Q1-2010Q4 had minimal effect on the results and findings. The same is also the case when defining the pandemic period as 2020Q1-2022Q2.

[5] This is due to the large impact of self-employment in that sector which is much more stable than non-agriculture flows. See Figure A1 for sectoral breakdowns.

Figure 1: Self employment aggregate statistics[6]

| A: **Share of the labour force**, per cent | B: **Entry and exit rate**, per cent |
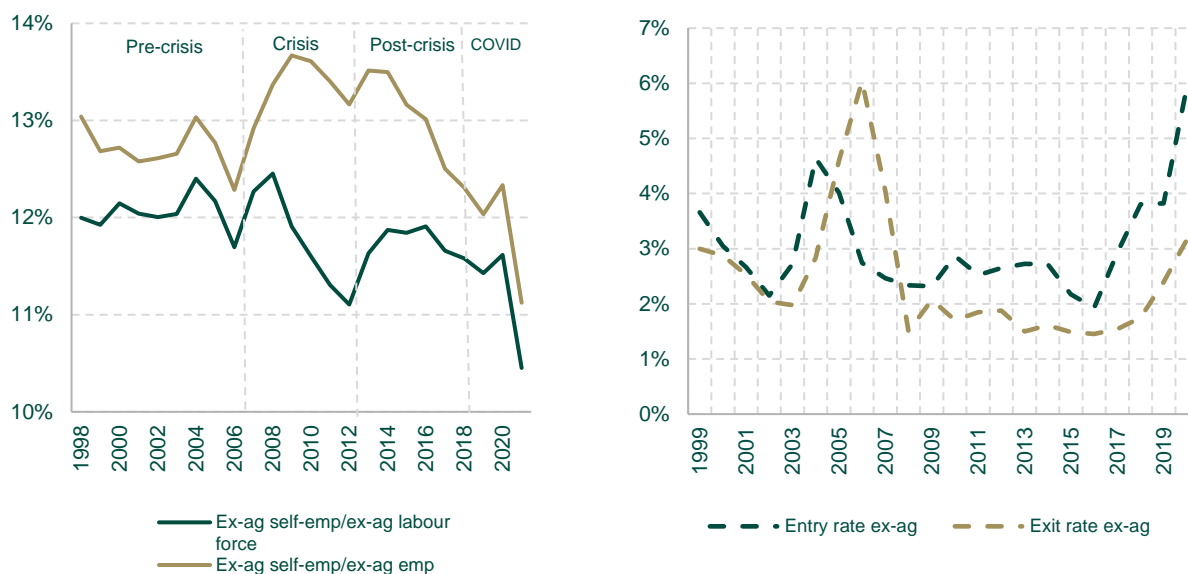
Figure 2 below shows the transition states of persons entering into and exiting out of self-employment over the sample. Looking at entrants, we can see that the share of those moving from unemployment into self-employment behaves counter-cyclically (gold bar), taking up a larger share of the transitions during the crisis and post-crisis years. Meanwhile, those who moved from employment to self-employment, possible opportunity entrepreneurs, never recover to their pre-crisis peak. Looking at the transitions out of self-employment, we see that during the same period, there is an increase in the share of those leaving self-employment to become unemployed post-crisis.

The interaction in these two forces, the necessity entrepreneurs offsetting the opportunity entrepreneurship associated with positive cyclical conditions, could explain the reason for the brief reverse in the overall declining trend in self-employment apparent in Figure 1a. As the economy recovered post-crisis, there was a gradual increase in self-employed that exited into employment as the wages on offer improved – however – it did not recover to its pre-crisis share of exit transitions. Overall, the entry and exit transitions suggest there are more individuals transitioning between self-employed status and unemployment than there was pre-crisis.

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[6] Exclude the agriculture sectors. Entry rate is defined as the number of newly self-employed at time t divided by the total population of self-employed at time t. the exit rate is those who leave self-employed status in t+1 divided by the total population of self-employed at time t.

Figure 2: Composition of self-employment transitions

A: *Entrants to self-employment and previous status*, per cent
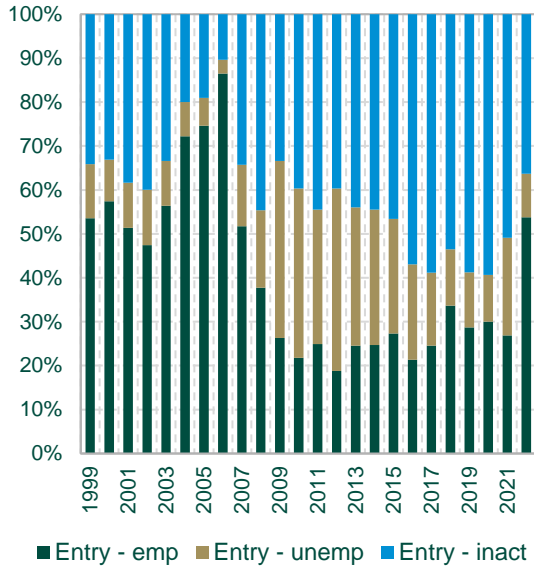
B: *departures from self-employment and subsequent status*, per cent
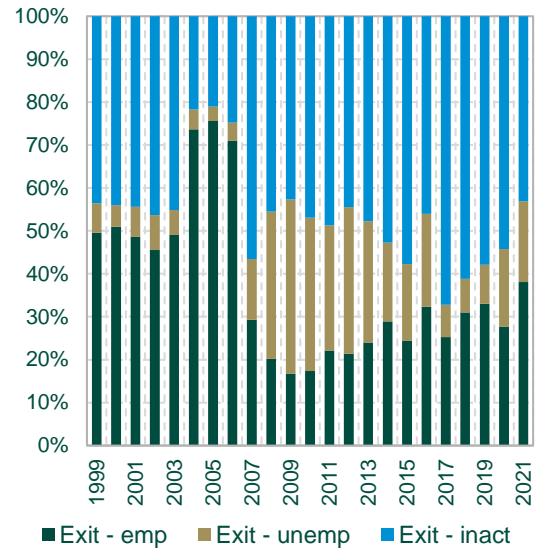
There is further evidence of a structural shift in the composition of self-employed when looking at the proportion of self-employed that have employees (Figure 3). Pre-crisis, those without employees (i.e. single person firms) make up about two thirds of the total, although we can see the share of self-employed persons with employees declined quite sharply in those post-GFC years. This is suggestive of potential opportunity and necessity dynamics operating over the business cycle.

Figure 3: Self-employed with employees vs. self-employed without

A: *Entry and exit rates,* per cent
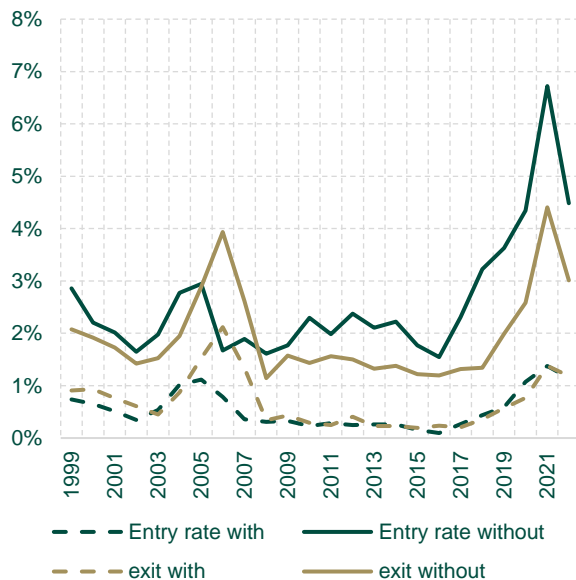
B: *self-employed with employees as a share of total*, per cent
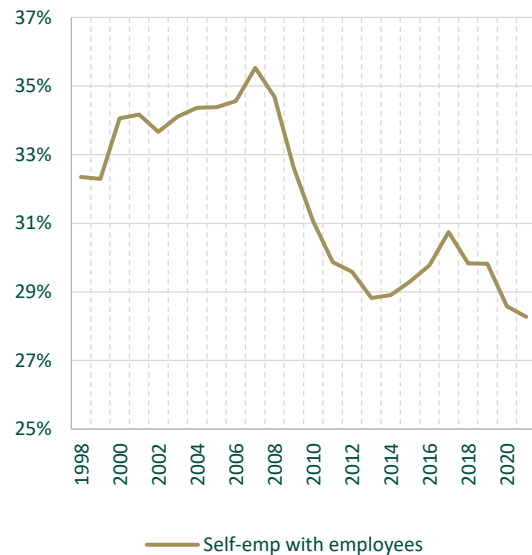
Table 1 below shows the mean characteristics of all sampled individuals across the different time periods. As shown in Figure 1B, we can see self-employed entry is lower in the sample during and post-

crisis. The share of individuals who entered self-employment pre-crisis was 0.2 per cent of the sample, while in the pandemic period this was 0.4 per cent. The majority of these entrants across periods are for those without employees. The share of the self-employed population who exit is around 4.2 per cent pre-crisis. This falls to around 2.5 per cent in the crisis, slightly increases to 2.7 per cent post-crisis before jumping to just over 9 per cent in the pandemic period.

The share of those unemployed increases over the different periods before falling in the pandemic period. At the same time, the share of those outside of the labour force, or 'inactive', is at its highest during the boom and it is lowest in the pandemic period. This latter result is something of a lower bound given those on employment supports were counted as employed during the period, while it also includes the second half of 2022 when the labour market saw a strong recovery. Mean age in the sample is in the 40s but increasing with the sample periods. Half of those sampled are married, with another 40 percent single. Finally, being a homeowner is included as a proxy for access to financial markets and credit together with assets and wealth, with this increasing over the sample.

| Table 1: Means of variables across the different periods				
	Pre-crisis	Crisis	Post-crisis	COVID
Self-employment entry	0.0022	0.0018	0.0018	0.0044
Entry with employees	0.0005	0.0003	0.0002	0.0008
Entry without employees	0.0017	0.0016	0.0016	0.0036
Exit	0.0426	0.0251	0.0269	0.0904
Exit with employees	0.0140	0.0049	0.0050	0.0243
Exit without employees	0.0293	0.0204	0.0221	0.0693
Unemployment	0.0217	0.0364	0.0418	0.0137
Inactive	0.3194	0.2811	0.2943	0.2588
Female	0.5258	0.5238	0.5263	0.5270
Age	42.3367	43.5053	45.6118	50.3961
Irish	0.9502	0.9024	0.8990	0.9152
Single	0.3968	0.3881	0.3781	0.3412
Married	0.5042	0.5137	0.5179	0.5402
Widowed	0.0633	0.0558	0.0568	0.0689
Divorced	0.0357	0.0425	0.0472	0.0497
Number of children	1.5212	1.2946	1.2359	1.1207
Low education	0.4495	0.3970	0.3294	0.2704
Medium education	0.3357	0.3374	0.3451	0.3364
Border	0.1163	0.1098	0.0828	0.0860
Midland	0.0601	0.0593	0.0611	0.0571
West	0.0820	0.0852	0.0938	0.0980
Dublin	0.2966	0.2382	0.2641	0.2614
Mid-east	0.1005	0.1008	0.1264	0.1412
Mid-west	0.0827	0.1010	0.1072	0.1124
South-east	0.1092	0.1209	0.0977	0.0823
South-west	0.1524	0.1848	0.1668	0.1616
Homeowner	0.5402	0.7761	0.7462	0.8267
Observations	2,562,002	782,648	1,184,993	258.090

Taken together, these statistics suggest that while the share of self-employed of the labour force paused its decline post-crisis, a changing composition of self-employment was a likely factor. This might point to increased necessity entrepreneurship in the period following the GFC which is yet to fully unwind. To further examine those potential dynamics, section 5 investigates the relationship between self-employment transitions and the business cycle.

Section 5: Empirical results

5.1 Cyclicality of self-employment entry and exit

The table below shows regressions linking aggregated self-employment transitions to the business cycle, proxied by the quarterly unemployment rate. Strong pro-cyclical effects are evident in the directions for unemployment rates with the entry and exit rate for self-employment; both have a negative relationship with the unemployment rate.

Table 2: Entry and exit rate relationship with business cycle		
	Entry Rate	Exit Rate
Unemployment rate	-0.0678**	-0.139***
	(0.0331)	(0.0397)
Constant	0.0305***	0.0358***
	(0.00291)	(0.00349)
Observations	94	95
R-squared	0.044	0.116

*** $p<0.01$ **$p<0.05$ *$p<0.1$. Standard errors in parentheses

From examining how the business cycle interacts with the different types of self-employment transitions in Table 3, it is apparent that a strong economy increases the likelihood of moving from employed to self-employed (defined as opportunity entrepreneurs by Fairlie, 2018), but it is also positively associated with moving from self-employment to employment. The latter impact may be due to the availability of higher wages within firms for those who have been self-employed, both out of necessity and opportunity. On the other hand, those who we define as necessity entrepreneurs - moving from unemployed to self-employed - are less likely to be created when the economy is growing. This is in line with the expectation that persons are more likely to enter self-employment out of necessity during a recession. Overall, this is consistent with the literature that opportunity entrepreneurs are created pro-cyclically, with necessity entrepreneurs created counter-cyclically. The differing relationships also motivates our control of previous labour market status when analysing entry.

Table 3: Labour market transitions related to business cycle						
	Entry			**Exit**		
Transition type	Emp to self-emp	Unemp to self-emp	Inactivity to self-emp	Self-emp to emp	Self-emp to unemp	Self-emp to inactivity
Unemployment rate	-9.993***	11.90***	0.371	-10.50***	13.25***	-1.088
	(1.414)	(1.591)	(1.595)	(1.644)	(1.793)	(1.093)
Constant	8.573***	6.003***	7.819***	8.675***	5.783***	8.233***
	(0.124)	(0.140)	(0.140)	(0.145)	(0.158)	(0.0961)
Observations	95	95	95	95	95	95
R-squared	0.349	0.376	0.001	0.305	0.370	0.011

*** $p<0.01$ **$p<0.05$ *$p<0.1$. Standard errors in parentheses. Regressions carried out on log of each variable.

5.2 Characteristics of self-employment entry

This section reports the output of probit estimations of the probability of entry into self-employment. Table 4 shows the marginal effects of the variables on the quarter-to-quarter probability of becoming self-employed for four separate probit estimations before, during, and after the GFC, as well as the pandemic period.

Unemployment is the variable with the strongest influence on entry dynamics and is statistically significant. Pre-crisis, an unemployed person's probability of becoming self-employed was about 0.7 percentage points higher than the 'base' of other persons, keeping the education level and the other

controls constant. This probability of entry from unemployment increases by approximately another 0.7 percentage points from the pre-crisis to crisis period, stabilises post-crisis, before peaking in the COVID period at around 4½ percentage points higher. Again, this signals an increased role of 'necessity' dynamics as a driver during the GFC and into the post-crisis period. A further significant spike occurred during the COVID period associated with the specific impact of the pandemic on employment, with the government support and increasing availability of remote working possibly encouraging this.

Table 4: Probability of self-employment entry: marginal effects				
	Pre-crisis	Crisis	Post-crisis	COVID
Unemployment	0.731***	1.440***	1.370***	5.173***
Inactivity	0.145***	0.344***	0.409***	0.958***
Female	-0.174***	-0.099***	-0.085***	-0.205***
Age	0.029***	0.016***	0.014***	0.051***
Age^2	-0.003***	-0.002***	-0.001***	-0.005***
Irish	0.006	0.000	-0.015*	-0.061*
Married/Civil Partner	0.052***	0.040***	0.023***	0.017
Widowed	0.030	-0.008	-0.012	-0.148***
Divorced/Separated	0.083***	0.038*	0.007	-0.048
Number of children	0.003**	0.003***	0.002**	0.009
Low education	-0.108***	-0.081***	-0.076***	-0.165***
Medium education	-0.035***	-0.035***	-0.039***	-0.083***
Homeowner	0.043***	0.044***	0.044***	0.086***
Regional Dummies	Yes	Yes	Yes	Yes
Average prob. In %	0.156	0.091	0.079	0.220
Observations	2,562,002	782,648	1,184,993	258,090

*** p<0.01 **p<0.05 *p<0.1

Age is included to capture labour market experience; we might expect older workers who have accumulated experience, contacts, occupation specific human capital and knowledge of markets to be more likely to enter self-employment (Parker 2004; Cowling and Taylor 2001). However, age may also be correlated with attitudes to risk and other attitudes to self-employment including working experience. In addition, older people may be more risk averse to the risks and responsibilities associated with self-employment compared to younger people (Miller, 1984). Of note is that the probability of becoming self-employed increases for older workers, although this shows significant decreasing returns which may be related to these different risk attitudes among age cohorts.

Irish nationality has a minimal impact on the probability of entering self-employment. This is surprisingly, given a depth of literature analyse the relationship between nationality, business cycles and self-selection bias.[7] The analysis also suggests that having a lower education level is negatively related to the probability of being self-employed versus an employee when controlling for education in a linear fashion.[8]

Table 5 reports probit estimation undertaken separately for those entering with and without employees. The impact of previous unemployed status on the probably on entering self-employment is much larger for those without employees, suggesting necessity dynamics are more applicable around singular rather than multiple job creation. For both groups, the probability of entering from unemployment increased in the crisis and post-crisis period, but the difference in the probability increase is much larger for entrants without employees (around ten times higher at 0.6 pp.). This suggests that increases in these necessity dynamics are amplified in low points of the business cycle.

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[7] For example, Batista et al (2017) find that the self-selection bias is positive both in the decision to initially emigrate, but also in the choice to return to their host country.
[8] However, recent evidence suggests there can be a U-shaped relationship (Astebero, 2011).

Table 5: Probability of self-employment entry with(out) employees: marginal effects								
	Pre-crisis	Crisis	Post-crisis	COVID	Pre-crisis	Crisis	Post-crisis	COVID
	With employees				*Without employees*			
Unemployment	0.010	0.075***	0.060***	0.369***	0.744***	1.372***	1.315***	4.797***
Inactivity	-0.001	0.030***	0.033***	0.061***	0.148***	0.310***	0.371***	0.881***
Female	-0.034***	-0.010***	-0.008***	-0.021***	-0.134***	-0.085***	-0.075***	-0.164***
Age	0.006***	0.001***	0.002***	0.012***	0.022***	0.014***	0.012***	0.036***
Age^2	-0.0007***	-0.0002***	-0.0002***	-0.001***	-0.003***	-0.002***	-0.001***	-0.004***
Irish	0.005	0.000	0.000	0.018*	0.001	0.000	-0.014**	-0.078**
Married/Civil Partner	0.024***	0.020***	0.006**	0.039***	0.026***	0.021***	0.017***	-0.017
Widowed	0.041**	0.034	0.006	-0.025*	-0.002	-0.021	-0.015	-0.109***
Divorced/Separated	0.040***	0.016	0.001	0.013	0.045**	0.024	0.006	-0.049**
Number of children	0.001	0.001**	0.001	0.003	0.002***	0.002***	0.002***	0.007
Low education	-0.030***	-0.011***	-0.007***	-0.019**	-0.073***	-0.067***	-0.067***	-0.129***
Medium education	-0.006**	0.001	0.001	-0.006	-0.027***	-0.034***	-0.038***	-0.068***
Homeowner	0.012***	0.008***	0.006***	0.011	0.030***	0.034***	0.037***	0.066***
Regional Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Average prob. In %	0.036	0.015	0.010	0.044	0.114	0.072	0.067	0.154
Observations	1,354,338	763,090	1,153,656	251,670	1,354,338	763,090	1,153,656	251,670

*** p<0.01 **p<0.05 *p<0.1

5.3 Decomposition results

This section reports decomposition results of the estimated models of the probability of entry into self-employment, with the purpose of determining how much of the difference between the entry rates over the different periods can be explained by changes in the independent variables and how much remains unexplained. Table 8 presents the results, with first three columns represent decompositions of the entry rate into self-employment as a whole. The first column compares the average quarterly entry rate pre-crisis (0.215 per cent) to the quarterly entry rate during crisis (0.183 per cent), while the second column compares during the crisis and the post-crisis (0.182 per cent). The third column then compares crisis and pandemic period (0.439 per cent), to see how both economic downturns may have differed. In all three cases, the difference between the mean entry rates is significant at the 1 per cent level.

Changes in the distributions of the independent variables explain a sizeable portion of the difference between the entry rates pre-crisis and the crisis period (see row "explained"), however this is dominated by the "unexplained" changes. This means that changes in the coefficients and the constant over time, as reflected in Table 6, significantly contribute to the decrease in the entry rate into self-employment between these periods. The "explained" component meanwhile had a positive contribution to the change, in part due to higher unemployment increasing the entry rate. When comparing the crisis and recovery period these two components balance out, leading to a small, albeit significant, fall.

The elevated pandemic period entry rate is due to a large jump in the unexplained component. This partly captures the change in the relationship between the unemployment rate and the entry rate, given some of those who were out of work (who may have been more likely to enter self-employment) were on pandemic related supports and not technically counted as unemployed.

The remaining columns of Table 6 show decompositions of the entry rates into self-employment with and without employees. The results for those with employees are similar to those for total self-employment; most of the difference in the entry rate from before the crisis to post pandemic is due to differences in the coefficients ("unexplained"), particularly in the pandemic period.

For those with employees, the increase in the entry rate before the crisis to the peak of it is small, and after the crisis, the entry rate increases further slightly, although this further increase is not significantly different from zero. About half of the increase during the crisis can be explained by the individual characteristics, again mostly by the unemployment status. Thus, unemployment plays a much smaller

role for entry into self-employment with employees than entry for those without, where this variable alone almost explains the full difference of the increase from before to the peak of the crisis. In summary, the decomposition results document that the increase in the total entry rate into self-employment during the GFC is mostly due to necessity entrepreneurship out of the larger pool of unemployed individuals during the GFC in the form of self-employment without employees

Table 6: Decomposition of entry rate into self-employment

	Total self-employment			Self-employed with employees			Self-employed without employees		
	Pre-crisis v crisis	Crisis v post-crisis	Crisis v covid	Pre-crisis v crisis	Crisis v post-crisis	Crisis v covid	Pre-crisis v crisis	Crisis v post-crisis	Crisis v covid
Crisis	0.183	0.183	0.183	0.0259	0.0259	0.0259	0.157	0.157	0.157
Comparison period	0.215	0.182	0.439	0.0577	0.0194	0.0825	0.166	0.162	0.356
Difference	-0.0429***	0.0017 ***	-0.2582***	-0.0318***	0.0062***	-0.0575***	-0.0111*	-0.0046	-0.2008***
Explained	0.0315***	-0.0195***	0.0056***	0.0032***	-0.0012***	0.0002	0.0282***	-0.0184***	0.0055*
Unexplained	-0.0744***	0.0212***	-0.2638***	-0.0361***	0.0074***	-0.0577***	-0.0393***	0.0139***	-0.2062***
N	2,117,428	1,916,746	1,014,760	2,117,428	1,916,746	1,014,760	2,117,428	1,916,746	1,014,760
N: Crisis	763,090	763,090	763,090	763,090	763,090	763,090	763,090	763,090	763,090
N: Comp	1,354,338	1,153,656	251,670	1,354,338	1,153,656	251,670	1,354,338	1,153,656	251,670

*** p<0.01 **p<0.05 *p<0.1

5.4 Characteristics of self-employment exit over business cycle

Finally, the characteristics for those to exit self-employment are detailed below in Table 7. Controls for the length of time an individual was self-employed before exiting are included. Females have a greater probability of exiting self-employment status compared to males. The results indicate that self-employment exit has a higher probability among less educated workers. Irish nationality, the number of children, and marriage status do not appear to have a significant impact on the probability of exiting self-employment.

Interestingly homeownership is positive pre-crisis, where this may be related to access to finance or assets, with those with greater access to credit or assets are more able to survive in self-employment (Holtz-Eakin et al 1994). During the crisis however it has a negative impact. There is evidence of negative duration dependence in self-employment, in that the probability of leaving falls with the elapsed duration in self-employment. This is a common finding in the literature, as the exit rates from self-employment are highest in the years immediately following entry (Carrasco 1999; Bates 1990; Taylor 2001; Lohman and Luber 2004; Millán et al 2013), although this relationship appeared to weaken in size during the pandemic period.

Finally, being a self-employed worker who has employees also reduces the probability that an individual will be observed to exit in the sample, suggesting it is mainly the necessity entrepreneurs who exit. This probability increases in the crisis years before falling again to close to zero during the pandemic period, suggesting there was more heterogeneity in the type of exitor, while it may also have been due to the government supports offered to those who might otherwise have ordinarily exited.

Table 7: Probability of self-employment exit: marginal effects				
	Pre-crisis	**Crisis**	**Post-crisis**	**COVID**
Female	2.551***	1.306***	1.670***	2.987***
Age	-0.479***	-0.346***	-0.361***	-0.418**
Age^2	0.0055***	0.0041***	0.0042***	0.0053***
Irish	-0.484	-0.550*	0.104	0.0221
Married/Civil Partner	-0.651***	0.341*	0.318*	-1.325
Widowed	-0.775	0.972*	0.170	-0.617
Divorced/Separated	-0.463	0.763**	0.654**	-2.430*
Number of children	0.0535	0.0423	0.0437	0.281
Low education	0.195	0.542***	0.0458	1.143
Medium education	-0.0896	0.289*	-0.0537	1.533**
Homeowner	0.345*	-0.735***	-0.273	-0.496
Self-employed duration 12-23 months	-0.727**	-1.029***	-0.333	-0.293***
Self-employed duration 24-59 months	-1.165***	-1.039***	-1.044***	-0.317***
Self-employed duration 60-119 months	-1.571***	-1.341***	-1.447***	-0.454***
Self-employed duration 120+ months	-2.656***	-2.131***	-2.186***	-0.528***
Has employees	-1.707***	-1.779***	-1.565***	-0.139***
Regional Dummies	Yes	Yes	Yes	Yes
Average prob. In %	4.497	1.890	2.075	8.326
Observations	72,372	40,392	50,897	8,416

*** p<0.01 **p<0.05 *p<0.1

Distinguishing between exit characteristics for with and without employee cohorts demonstrates significant divergence. Of particular note is that cohorts with employees were much more likely to exit against the base in the crisis period. For without employee cohorts, the same age cohorts were less likely to exit during the crisis period. Low education became a more likely factor for exit during the crisis for the with employee cohorts, perhaps pointing toward the sectoral focus of the downturn. For both cohorts, duration was negatively associated with exit across time.

Table 8: Probably of exit for self-employed with(out) employees: marginal effects

	With employees				Without employees			
	Pre-crisis	Crisis	Post-crisis	COVID	Pre-crisis	Crisis	Post-crisis	COVID
Female	1.906***	1.070***	1.315***	1.376	3.137***	1.534***	1.949***	3.923***
Age	-0.226***	-0.109***	-0.188***	-0.555***	-0.673***	-0.560***	-0.484***	-0.408**
Age2	0.0026***	0.0014***	0.0022***	0.0056***	0.0078**	0.0067**	0.0056**	0.0056**
Irish	-0.244	-0.480	-0.0839	-0.545	-0.545	-0.681	0.0303	0.0431
Married/Civil Partner	-0.311	0.542***	0.223	0.654	-0.903***	0.236	0.196	-2.449**
Widowed	-0.759	1.431*	0.359	0.529	-0.594	1.083	-0.007	-1.432
Divorced/Separated	-0.222	0.709	0.225	-0.722	-0.677	1.067	0.130**	-3.413**
Number of children	-0.0131	-0.0219	0.0239	-0.163	0.109	0.0957	0.412	0.488
Low education	0.290	0.778***	-0.0215	-0.497	0.178	0.395	0.0505	2.673*
Medium education	0.0000	0.189	-0.164	-1.065	-0.139	0.386	-0.0283	3.232***
Homeowner	0.851***	-1.114**	-0.0389	-0.918	0.0124	-0.736**	-0.007	-0.706
Self-employed duration 12-23 months	0.645	-0.423*	0.0477	-3.984*	-1.262***	-1.596***	-0.504	-3.843**
Self-employed duration 24-59 months	-0.108	-0.318	-0.607*	-2.001	-1.669***	-1.692***	-1.376***	-4.477***
Self-employed duration 60-119 months	-0.826*	-0.605***	-0.775**	-0.995	-1.923***	-2.054***	-1.932***	-6.820***
Self-employed duration 120+ months	-1.496***	-1.189***	-1.100**	-1.131	-3.307***	-2.887***	-2.856***	-1.079***
Regional Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Average prob. In %	3.332	0.831	1.040	6.236	5.623	3.011	2.901	9.398
Observations	32,447	17,185	18,268	2,924	39,925	23,207	32,629	5,492

*** p<0.01 **p<0.05 *p<0.1

Section 6: Summary and policy implications

The self-employed make up a substantial and important proportion of the labour force, their entry and exit from the workforce as 'entrepreneurs' is the driving force for the process of creative destruction that grows employment and the economy over time. However, not all new firms create additional employment or add to the productive capacity of the economy. Many new firms are small, and many never grow at all (Hurst and Pugsley, 2011). In that sense, understanding selection into entrepreneurship (and exit) provides valuable insight for policymakers; and understanding differences in the type of entry and exit at different points of the business cycle can help to better understand policy in the context of both ex-ante and ex-post interventions.

The share of self-employed workers within the labour force in Ireland trended downward from the late 1990s, but this trend paused in the post GFC period with changing composition of these entrants and exitors of self-employment a significant factor. The compositional shift reflected a greater share of self-employment arriving from unemployed status compared to pre-crisis, while also of note is a larger share of self-employed workers exiting to unemployment. This suggests that – in the periods highlighted – an increased number of self-employed are worked on the margins, focused on survival with necessity dynamics an increased factor as opposed to further job creation.

Transitions in and out of self-employment status and their relationship to the business cycle were also examined. It was shown that periods of low unemployment increase the likelihood of moving from employed to self-employed, the 'opportunity' entrepreneurs, but it is also positively associated with moving from self-employment to employment. On the other hand, those who we define as 'necessity' entrepreneurs moving from unemployed to self-employed - are less likely to be created when unemployment is low. This is in line with our expectation that these are more likely be created in a recession. Overall, this is consistent with the literature that the creation of opportunity entrepreneurs is pro-cyclical, while necessity entrepreneurs is counter-cyclical.

Further insight into these dynamics is gained through performing analysis on entry and exit over a range of characteristics, including whether they are self-employed with employees or not. For entry, unemployment is the variable with the strongest influence with this rising over time. This impact is also much larger for those without employees, suggesting that necessity dynamics are more applicable around singular rather multiple job creation. For both groups, the probability of entering from unemployment increased in the crisis and post-crisis period, but the difference in the probability increase is much larger for entrants without employees. This suggests that increases in these necessity dynamics are more substantial in low points of the business cycle. Decomposition results also document that the increase in the total entry rate into self-employment during the GFC is mostly due to necessity entrepreneurship in the form of self-employment without employees.

Finally, being a self-employed worker who has employees also reduces the probability that an individual will be observed to exit in the sample, suggesting it is mainly the necessity entrepreneurs who exit. This probability increases in the crisis years before falling again to close to zero during the pandemic period, suggesting there was more heterogeneity in the type of exitor during this period, although it may also have been due to the government supports offered to those who might otherwise have ordinarily exited. Overall these results suggest that in normal recessionary periods, any increase in the self-employment entry rate is likely to be temporary in nature and will not lead to boosts in further employment. Although we don't study productivity differences between the different types of self-employed, if necessity entrepreneurs are less productive in nature it will mean that they cannot be expected to drive future growth in downturns.

Whilst these results are descriptive in nature, they are useful not only for the study of entrepreneurship but also for understanding the role of self-employment in the economy. The fact that self-employment provides a form of insurance for less educated and lower income workers suggests that policies which make it more expensive to start and operate a business will tend to increase unemployment in downturns which may increase scarring. These findings may also highlight another feature of Ireland's flexible labour force. On the other hand, these policies should be focused on certain types of individuals in order to reduce business failure and improve the quality of entrepreneurship.

Section 7: Bibliography

Åstebro, T., Chen, J., & Thompson, P. (2011). Stars and misfits: Self-employment and labor market frictions. *Management Science*, *57*(11), 1999-2017.

Bates, T. (1990). *Self-employment trends among Mexican Americans* (No. 90-9).

Batista, Catia, Tara McIndoe-Calder, and Pedro C. Vicente. "Return migration, self-selection and entrepreneurship." Oxford Bulletin of Economics and Statistics 79, no. 5 (2017): 797-821.

Belitski, M., Guenther, C., Kritikos, A. S., & Thurik, R. (2022). Economic effects of the COVID-19 pandemic on entrepreneurship and small businesses. *Small Business Economics*, 1-17.

Bell, D. N., & Blanchflower, D. G. (2011). Young people and the Great Recession. *Oxford Review of Economic Policy*, *27*(2), 241-267.

Berglann, H., Moen, E. R., Røed, K., & Skogstrøm, J. F. (2011). Entrepreneurship: Origins and returns. *Labour economics*, *18*(2), 180-193.

Benanke, B., & Gertler, M. (1989). Agency costs, net worth, and business fluctuations. *American Economic Review*, *79*(1), 14-31.

Bewley, T. F. (1999). *Why wages don't fall during a recession*. Harvard university press.

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

Blanchflower, D. G. (2000). Self-employment in OECD countries. *Labour economics*, *7*(5), 471-505.

Blinder, A. S. (1973). Wage discrimination: reduced form and structural estimates. *Journal of Human resources*, 436-455.

Brünjes, J., & Diez, J. R. (2013). 'Recession push' and 'prosperity pull' entrepreneurship in a rural developing context. *Entrepreneurship & Regional Development*, *25*(3-4), 251-271.

Caballero, R., & Hammour, M. (1994). The Cleansing Effect of Recessions American Economic Review 84 (5).

Carrasco, R. (1999). Transitions to and from self-employment in Spain: an empirical analysis. *Oxford Bulletin of Economics and Statistics*, *61*(3), 315-341.

Conefrey, T., Lawless, M., & Linehan, S. (2015). Developments in the Irish labour market during the crisis: what lessons for policy?.

Congregado, E., Golpe, A. A., & Parker, S. C. (2012). The dynamics of entrepreneurship: hysteresis, business cycles and government policy. *Empirical Economics*, *43*, 1239-1261.

Cowling, M., & Taylor, M. (2001). Entrepreneurial women and men: two different species?. *Small Business Economics*, 167-175.

Dustmann, Christian, and Oliver Kirchkamp (2002). "Migration Duration and Activity Choice After Re-Migration", Journal of Development Economics, 67: 351-372.

Evans, D. S., & Jovanovic, B. (1989). An estimated model of entrepreneurial choice under liquidity constraints. *Journal of political economy*, *97*(4), 808-827.

Fortin, N., Lemieux, T., & Firpo, S. (2011). Decomposition methods in economics. In *Handbook of labor economics* (Vol. 4, pp. 1-102). Elsevier.

Gertler, M., & Bernanke, B. (1989). Agency costs, net worth and business fluctuations. In *Business cycle theory*. Edward Elgar Publishing Ltd.

Fairlie, R. W. (2013). Entrepreneurship, economic conditions, and the great recession. *Journal of Economics & Management Strategy*, *22*(2), 207-231.

Fairlie, R. W., & Fossen, F. M. (2018). Opportunity versus necessity entrepreneurship: Two components of business creation.

Fisher, I. (1933). The debt-deflation theory of great depressions. *Econometrica: Journal of the Econometric Society*, 337-357.

FitzGerald, J., & Kearney, I. (1999). *Migration and the Irish labour market* (No. WP113).

Fossen, F. M. (2021). Self-employment over the business cycle in the USA: a decomposition. *Small Business Economics*, *57*(4), 1837-1855.

Fritsch, M., S. Kritikos, A., & Sorgner, A. (2015). Why did self-employment increase so strongly in Germany?. *Entrepreneurship & Regional Development*, *27*(5-6), 307-333.

Haltiwanger, J., Jarmin, R. S., & Miranda, J. (2013). Who creates jobs? Small versus large versus young. *Review of Economics and Statistics*, *95*(2), 347-361.

Holtz-Eakin, D., Joulfaian, D., & Rosen, H. S. (1994). Sticking it out: Entrepreneurial survival and liquidity constraints. *Journal of Political economy*, *102*(1), 53-75.

Hurst, E., & Pugsley, B. W. (2011). *What do small businesses do?* (No. w17041). National Bureau of Economic Research.

Keynes, J. M. (1936). The supply of gold. *The Economic Journal*, *46*(183), 412-418.

Lin, Z., Picot, G., & Compton, J. (2000). The entry and exit dynamics of self-employment in Canada. *Small business economics*, *15*, 105-125.

Millán, J. M., Hessels, J., Thurik, R., & Aguado, R. (2013). Determinants of job satisfaction: a European comparison of self-employed and paid employees. *Small business economics*, *40*, 651-670.

Miller, R. A. (1984). Job matching and occupational choice. *Journal of Political economy*, *92*(6), 1086-1120.

Nolan, A., & Barrett, A. (2019). The role of self-employment in Ireland's older workforce. *The Journal of the Economics of Ageing*, *14*, 100201.

Oaxaca, R. (1973). Male-female wage differentials in urban labor markets. *International economic review*, 693-709.

Parker, S. C. (2004). *The economics of self-employment and entrepreneurship*. Cambridge university press.

Parker, S. C. (2009). Why do small firms produce the entrepreneurs?. *The Journal of Socio-Economics*, *38*(3), 484-494.

Parker, S. C., Congregado, E., & Golpe, A. A. (2012). Is entrepreneurship a leading or lagging indicator of the business cycle? Evidence from UK self-employment data. *International Small Business Journal*, *30*(7), 736-753.

Ritsilä, J., & Tervo, H. (2002). Effects of unemployment on new firm formation: Micro-level panel data evidence from Finland. *Small business economics*, *19*, 31-40.

Schumpeter, J. A., & Nichol, A. J. (1934). Robinson's economics of imperfect competition. *Journal of political economy*, *42*(2), 249-259.

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 in Britain: evidence from panel data. *Economica*, *68*(272), 539-565.