
SELF-EMPLOYMENT AND WORKPLACE WELLBEING

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ABSTRACT

By introducing psychological theories into entrepreneurship research field, this thesis aims to investigate the relationship between self-employment and workplace wellbeing. The thesis consists of three empirical studies, which set out to answer the following questions: 1) What are the differences of workplace wellbeing between the self-employed and employees? 2) What factors contribute to workplace wellbeing in both direct and indirect ways? 3) What is the relationship between negative workplace wellbeing and positive wellbeing, 4) How does coping mechanism reduce negative workplace wellbeing and enhance positive wellbeing? Moreover, this thesis also examines the specific issues of self-employment, such as workplace wellbeing of the self-employed under the poverty line and the differences between the self-employed with hiring employees and the self-employed without hiring any employee.

This quantitative and comparative thesis has employed the matching approach to overcome selection bias and combined with other statistical methods such as CFA, SEM and moderating hierarchy regression to test the conceptual models empirically. The data used for this research is sourced from the Understanding Society, the largest household panel data in the UK.

This thesis found that the self-employed experience higher positive workplace wellbeing than employees. The self-employed with hiring employees experience a significantly higher level of negative workplace wellbeing than employees. However, the self-employed without hiring any employee experience significant higher negative

workplace wellbeing. Moreover, this thesis found that job demand and job control contribute to negative workplace wellbeing directly, and the relationship can be partly moderated by social support. In addition, the thesis has tested the relationship between the positive workplace wellbeing and negative workplace wellbeing, which has been verified as negative. Lastly, the results showed self-efficacy is an effective coping factor to reduce negative wellbeing and enhance positive wellbeing.

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CHAPTER 1 INTRODUCTION

1.1 Research Context

The self-employed are commonly defined as the ‘individuals who earn no wage or salary but who derive their income by exercising their profession or business on their account and at their own risk.’(Parker,2004: 6). The analysis of the impact of self-employment usually takes into account the impacts on macro- (society level) and microeconomic scale (individual level). At the society level, this group of people has been considered to be a significant economic force and plays a significant part in the current labour market of the record-low unemployment rate. This is because they help to remain individuals attached to the labour market who might otherwise exit, they acquire human capital which enhances their future labour market chances, and they present a ‘signal’ of positive characteristics toward future employers (Felstead, Gallie and Green, 2015). Particularly, in the UK, self-employment is on the rise. It now is a large and growing part of the UK labour force. Five million people—15% of the workforce—are now self-employed, which account for more than 1 in 7 workers in the UK(House of Work and Pensions Committee,2017). Also, since the 2008 financial crisis, shifts to self-employment have helped drive a recovery in employment, which has risen from 70.1 percent of covering unemployment in the third quarter of 2011 to a record high of 74.2 percent in the first quarter of 2016(House of Work and Pensions Committee,2017). The performance of those who are self-employed has been acknowledged by the Office of National Statistics (ONS), who stated that trends in this

area are one of the ‘defining characteristics’ of the UK's economic recovery (Office for National Statistics,2015).

At the individual level, studies on the impact of self-employment primarily focus on the financial performance of the individual self-employed, for example, the growth rate of their companies, the size of recruitment, profits and customers. However, these indicators fall short of capturing many aspects of the sound flourishing work and living conditions. On the other hand, another trend has emerged in the UK. The workplace wellbeing has been emphasised as a significant policy agenda in the UK and other EU countries. This is because wellbeing is not only an important individual phenomenon, but also is a critical indication of socio-economic progress and constitutes a vital social resource (Uly, Foo and Song, 2013). Nonetheless, negative workplace wellbeing consumes massive social resources and incurs financial cost (Felstead, Gallie, and Green, 2015). As a matter of fact, the overall situation of workplace wellbeing in the UK and EU countries is not as positive as people have expected. For example, in the UK, a great number of British workers, above 15 million populations, actually are dissatisfied with their jobs (Wales and Amankwah, 2016). In the EU countries, 47% individuals indicated that they have at least more than two health issues, which show ‘ a strong connection between the physical and mental dimensions’. Moreover, the EU-OSHA survey found that around half of workers in the EU countries have said that they commonly had work-related stress while working (EU-OSHA, 2013). Therefore, the workplace wellbeing has become a significant issue in the national policy agenda.

For example, the Europe 2020 Strategy for Growth, Competitiveness and Sustainable Development Report emphasised that health and wellbeing are the fundamental elements, as it stated ‘Policies on health and wellbeing are considered of primary importance to the European Union and individual member states’ (Eurofound, 2015: 5). In the UK, the government issued the Dame Carol Black Review of the Health of Britain’s working age population-’working for a Healthier Tomorrow’. Among other things, this review has suggested that ‘workplaces should go beyond compliance with health and safety and other relevant employment law, and extend their agenda to promoting employee health and wellbeing’ (Carol,2008:53), which emphasised the increasing focus on both depression and work-related stress in the UK.

Consequently, as the two issues noted above, on the one hand, the boom of self-employment implies that self-employment should no longer be regarded as a fringe activity but instead to a mainstream form of work that merits more attention from researchers, which calls for more studies to go with the grain of this potentially enduring trend. On the other hand, the workplace wellbeing of the labour force, as one of the most significant policy issue in the UK, should not exclude self-employment into consideration. By combining these two significant facts in the UK, interesting questiones are posted in this thesis, ‘if wellbeing is such a grave concern in the workplace, what about the workplace wellbeing of self-employed people? What is the impact of self-employment on workplace wellbeing at the individual level?’ Moreover, a good understanding in the incidence of self-employment at the micro level can extend

the in-depth and personal knowledge that is easily ignored in macro level studies and enhance our understanding of the impact of self-employment at the macro level.

From an academic perspective, the research interest in workplace wellbeing emerged quite late, and many of significant themes studied within the psychological area on wellbeing have not yet to make their way into the self-employment research (Diener et al., 2002; Keyes, 2002). This is an important inquiry in current academic field. Firstly, workplace wellbeing has been shown to serve as a strong predictor of such behaviours as workers' commitment, motivation, absenteeism, quitting intentions, and other affective responses to aspects of the job or the employer which closely relate to the organisation's performance or business success (Gazioglu and Tans el, 2006; Lange 2012). Secondly, with regard to motivation studies, an increasing emphasis on current research focuses on the determinants of pursuing self-employment (Dolinsky and Caputo, 2003). When one plans to be one of the self-employed, he/she always considering the rewards of his/her self-employment. In the past, self-employment reward has almost exclusively been defined as financial outcomes. While such measurements are indeed important indicators of success, however, currently growing recognition in the field of the self-employment research indicates that a somewhat broader definition of 'the self-employment reward'—one that including wellbeing is as important as financial outcomes. Indeed, research findings indicate that many individuals, who are driven to be the self-employed with more non-monetary intentions and are more caring about the influence of self-employment on their wellbeing (Baron

and Torero 2012; Cassar, 2007). Many researches, however, have mainly focused on the positive factors that attract people to be the self-employed and focus less on the consequences or outcomes of being the self-employed. However, the picture is complex, and the impact of entrepreneurs varies according to the length of time over which outcomes are measured (Baumberg and Meager, 2015). Therefore, understanding the self-employment process and its relationship with workplace wellbeing can provide new and valuable insights. As Shepherd (2015) suggests, one of the most promising avenues for future entrepreneurship research will be where ‘the head engages the heart.’

Moreover, this thesis will conduct a comparative analysis to examine the differences between the self-employed and employees on the issue of workplace wellbeing.

1.2 Definitions of Entrepreneurship and Self-employment

1.2.1 Definition of Entrepreneurship

Defining entrepreneurship has been regarded as one of the most challenging and intractable tasks faced by researchers working in the field. This is due to the ‘proliferation of theories, definitions and taxonomies of entrepreneurship which often conflict and overlap, resulting in confusion and disagreement among researchers and practitioner about precisely what entrepreneurship is’ (Parker, 2004:5). From a holistic perspective, entrepreneurship is a multi-disciplinary field, includes economics, finance, business and management, economic History, sociology, psychology, economic

geography, Law, Politics and Anthropology. It is more than two and half hundred years since entrepreneurship as a phase was firstly coined by Cantillon (1755), who was a French economist. So far, definitions for entrepreneurship are developed and defined variously mainly due to the differentiated traditions within the field of entrepreneurship. These traditions include anthropology (de Mintoya, 2000; Firth, 1967), social science (Swedberg, 1993, Waldringer, Aldrich, and Ward,1990), economics (Casson, 2003, Kirzner,1973, Schumpeter,1934) and management(Drucker, 1999, Ghoshal and Barlett, 1995). Table 1 exhibits a brief review of extant definitions, which covers all the main popular definitions of entrepreneurship. Combining ideas from widely-used definitions and the policy agenda, the new Entrepreneurship Indicators Programme (EPT) defines entrepreneurs as ‘those persons (business owners) who seek to generate value, through the creation or expansion of economic activity, by identity and exploiting new products, processor markets’(OECD,2008:10). However, as OECD itself indicates that this definition to a greater extent has taken its politic consideration into account. This Definition emphasises more on contributions of entrepreneurship to the economy and society and focuses on the value and innovation created during entrepreneurship. The table is referred here with coding the most obvious nature of the entrepreneurship from definitions. Originally, entrepreneur derives from the French verb entrepreneur, meaning ‘to undertake’. From the Table 1, it is evident that academics defining entrepreneurship or entrepreneurs are not just simply go straight to define entrepreneurship as starting own business. Distinguished keywords spotted from

the brief content of definitions on entrepreneurship include uncertainty, creative/innovation, opportunity, managing resources, risk-taking, producing values and social work, which establish the complex image of entrepreneurship.

Table 1: A Review of Extant Definitions

Essence of definition	publication	Coding keyword
Entrepreneurs buy at certain prices in the present and sell at uncertain prices in the future. The entrepreneur is a bearer of uncertainty.	(Cantillon, 1755)	Uncertainty
Entrepreneurs are 'pro-jectors'.	(Defoe, 2001)	Uncertainty
Entrepreneurs attempt to predict and act upon change within markets. The entrepreneur bears the uncertainty of market dynamics	(Knight, 1942)	Uncertainty
The entrepreneur is the person who maintains immunity from control of rational bureaucratic knowledge	(Weber, 1947)	Creativity
The entrepreneur is the innovator who implements change within markets through the carrying out of new combinations. These can take several forms: 1) the introduction of a new good or quality thereof; 2) the introduction of a new method of production; 3) the opening of a new market; 4) the conquest of a new source of supply of new materials or parts; and 5) the carrying out of the new organisation of any industry.	(Schumpeter, 1934)	Innovative
The entrepreneur is always a speculator. He deals with the uncertain conditions of the future. His success or failure depends on the correctness of his anticipation of uncertain events. If he fails in his understanding of things to come he is doomed	(von Mises, 1996)	Uncertainty
The entrepreneur is co-ordinator and arbitrageur.	(Walras, 1954)	Resources and profit
Entrepreneurial activity involves identifying	(Penrose, 198)	Opportunity

opportunities within the economic system	0)	
Entrepreneurship is the act of innovation involving endowing existing resources with new wealth-producing capacity.	(Kirzner, 1973)	Opportunity and profit
The essential act of entrepreneurship is a new entry. A new entry can be accomplished by entering new or established markets with new or existing goods or services. A new entry is the act of launching a new venture, either by a start-up firm, through an existing firm, or via internal corporate venturing’.	(Drucker, 1985)	Innovation resources and profit
The field of entrepreneurship involves the study of sources of opportunities; the processes of discovery, evaluation, and exploitation of opportunities; and the set of individuals who discover, evaluate, and exploit them.	(Lumpkin and Dess, 1996)	Innovation
Entrepreneurship is a context-dependent social process through which individuals and teams create wealth by bringing together unique packages of resources to exploit marketplace opportunities.	(Shane and Venkatarama, 2000)	Opportunity
Entrepreneurship is a context-dependent social process through which individuals and teams create wealth by bringing together unique packages of resources to exploit marketplace opportunities.	(Ireland, Hitt, and Sirmon, 2003)	Social, resources, opportunity
Entrepreneurship is the mindset and process to create and develop economic activity by lending risk-taking, creativity and innovation with sound management, within a new or an existing organisation	(Commission of the European Communities, 2003)	Risk- taking, creativity
Entrepreneurs are those persons (business owners) who seek to generate value, through the creation or expansion of economic activity, by identifying and exploiting new products, processor markets.	(OECD,2008)	value/innovation

1.2.2 Definition of Self-employment

Self-employment is the oldest way in which individuals offer and sell their labour in a market economy. In the ancient time, it was also the primary way in the labour market. The word 'self-employment' is simply defined by the Cambridge dictionary as 'not working for an employer but finding work for yourself or having your own business.' More specifically, as noted at the beginning of this thesis, the self-employed are often taken to be individuals who earn no wage or salary but who derive their income by exercising their profession or business on their account and at their own risk (Parker, 2004: 6). The term 'self-employment' is more commonly applied to practical and legal documents compared with entrepreneurship. The UK government defined people are self-employed individuals 'if they run their business for themselves and take responsibility for its success or failure.' (Government Webportal, 2017). Under UK tax law, common law standards are used to determine whether an individual works under a contract of service as an employee or under a contract for services as a self-employed individual. The UK Government currently list conditions that individuals should be considered as the self-employed for tax purposes if:

- 'They put in bids or give quotes to get work;
- They are not under direct supervision when working;
- They submit invoices for the work they have done;
- They are responsible for paying their own National Insurance and tax;

- They do not get holiday or sick pay when they are not working; they operate under a contract... that uses terms like ‘self-employed’ (Government Webportal, 2017).

1.2.3 The application of entrepreneur and the self-employed in academic research

Not all the self-employed are entrepreneurs. Self-employed people often run businesses that they did not found and routinely manage them (Robinson and Sexton 1994). In this respect, innovation can help differentiate entrepreneurs from the rest of self-employed people. Many self-employed people play the role of entrepreneurs at least when they start up their businesses. However, this is not the case of all the self-employed, since some of them enter self-employment as a result of a succession process in a family business or the acquisition of an incumbent business. Even in the case of those who create their businesses, many of them later carry out a mere routine management of their companies or are exclusively concerned with their firm’s survival (Plotnikova and Martínez-Román, 2016). On the other hand, an entrepreneur is more about risk and reward. They think outside the box for the best ways to succeed and move on to their next venture. While the businesses might be of interest it is really the passion of the start-up and leading something to success that drives them every day.

More generally, the differentiation between these conventional self-employed people and the ones with an entrepreneurial orientation is a relevant issue from the research and policy perspective. Regarding academic perspective, for most quantitative researchers, self-employed has been used interchangeably with ‘entrepreneur’ as it is

easier to define, there is widespread availability of data on the self-employed in various surveys worldwide, and it is also a more straightforward approach to operationalise in empirical research(Katz,1994). As Parker(2004:5) concluded ‘at the conceptual level, the terms ‘entrepreneur’ and ‘entrepreneurship’ will be used; in practice, where issues of measurement, estimation and policy are involved, the research will use the closest approximation to the manifestation of entrepreneurship that appears to be suitable.’ In this thesis, the ‘self-employed’ will be applied as the subject in this entrepreneurship study. Moreover, the general definition of ‘the self-employed’ is taken as the measurement, which is ‘the individuals who earn no wage or salary but who derive their income by exercising their profession or business on their account and at their own risk’ (Parker, 2004: 6)

1.3 Workplace wellbeing and Entrepreneurship

1.3.1 Definition of wellbeing and workplace wellbeing

Wellbeing is a multidimensional concept. In essence, it can be broadly defined as ‘the basic and universal human needs that if an individual’s needs are satisfied at the current time, the individual will be happy’ (Diener et al., 1999:278). This definition assumes that happiness is the sum of many small positive pleasures. However, as a matter of fact, wellbeing is the sum of positive and negative effects, when one’s feeling of pleasures exceed pains, then he or she can be defined as happiness (Walter-Busch, 2000, Veenhoven, 1996). More specifically, Diener et al.(1999) concluded that wellbeing is

essentially stresses-pleasant emotional experience, which should consist of both positive and negative affect. Negative affect and Positive effect for these qualities, explaining they represent predispositions to experience the corresponding mood factors. The negative effect is a general dimension of subjective distress subsuming a broad range of negative emotions such as anger, disgust, scorn, guilt, fearfulness, and depression. The positive effect, on the other hand, reflects the level of energy, excitement, and enthusiasm (Watson and Pennebaker, 1989), all are measured as state (transient) or trait (stable) qualities. Watson and Pennebaker (1989) suggested that high negative affect individuals tend to be more introspective, dwell on shortcomings, focus on the downside of the world, hold a less favourable self-view, and experience significant levels of distress and dissatisfaction in any given situation. Low Negative effect individuals tend to be content, secure and self-satisfied. Positive effect reflects general levels of energy and enthusiasm, with high trait positive effect subjects leading a full and happy life and maintaining a high activity level.

In academic research, the topic of wellbeing has been gained presence rapidly in social sciences and economics. Two primary research contexts have developed in recent years. The first one is the analysis of life wellbeing, which is about individual's overall life satisfaction or happiness (Plagnol,2010), and the second is the analysis of job-related wellbeing, better known as 'workplace wellbeing', which is one of the critical dimensions of overall life wellbeing. Indeed, on average, a person spends much of his/her life on working, around 25% to 35% of his daytime life in the work (Harter,

Schmidt and Keyes, 2003). Thus, the job is a significant part of an individual's life closely associated with his or her life and wellbeing. On the one hand, positive workplace wellbeing can enhance overall life wellbeing. For example, around 20% to 25% of the variation in adult life satisfaction can be accounted by job satisfaction (Campbell, Converse, and Rodgers,1976). The results from previous studies indicate that the measurement of job satisfaction correlates as much as 0.50 to 0.60 with measurement of life satisfaction (Judge and Watanable,1993; Spector,1997). On the other hand, negative workplace wellbeing is also closely associated with life wellbeing. This is because the nature of work such as routinization, supervision, and complexity has been linked causally to an individual's sense of control and depression (Kohn and Schooler,1982). Moreover, it is now recognised that job depression is the second factor (the first one is ischemic heart disease) in contributing to reduction in productive and healthy years of life (Murray and Lopez, 1996). Consequently, in general, when referring to the concepts of wellbeing, the workplace wellbeing can be defined as part of overall life wellbeing which is primarily determined by work and can be affected by workplace interventions.

1.3.2 Measurements of workplace wellbeing

However, the measurement of workplace wellbeing is a complicated challenge, which depends on various factors including social, emotional and physical elements, and takes the perspective from both the internal and external workplace. Also, it may also need to involve many different roles (e.g. occupational health, occupational safety,

human resources (HR) services, senior management, line management, health services, trade unions and labour inspectors), for each role has a different motivation for improving and promoting workplace wellbeing. Moreover, different occupations and workplaces will have their own particular workplace wellbeing requirements and priorities. For example, the needs of a driver may be very distinct from those of a shop worker. Furthermore, the outcomes of workplace initiatives are very subjective, and an initiative that works well for one driver may be of little or no benefit to another driver. These complexities make workplace wellbeing very hard to define and measure, but research has been carried out to develop a better understanding of the concept and to gain a consensus on the subject (EU-OSHA,2013)

For example, Some researches highlight using a short tool to measure the workplace wellbeing, for example, a one-item indicator to gauge job satisfaction(Sousa-Poza and Sousa-Poza, 2000). Some focus on a long tool, like a five-item indicator, the WHO's wellbeing index (WHO-5) (Sjöberg, 2010), which gather information on psychological wellbeing, that are useful within organization. Some researches show that workplace wellbeing could focus on stress factors that include organisational pressure (i.e. Job anxiety and depression) (VanKatwyk et al., 2000). Other scales move across a continuum with two principal axes covering anxiety–contentment and depression–enthusiasm, to arrive at an assessment of effective wellbeing. Anxiety–contentment could be shown through individuals being tense, worried or relaxed, while depression–enthusiasm could be demonstrated through being depressed, cheerful or optimistic

(Warr, 1990). Moreover, in some researches, the measuring of wellbeing has to rely to a large extent on individuals' subjective view of how they feel or believe they are capable of functioning or coping at any point in time, while some researchers suggested this subjective assessment could be replaced with relatively objective measures such as sickness absence rates (North et al., 1993). Sometimes, the measurement of workplace wellbeing may also need to take into account the specific demands of any one profession, for example, nursing, where emotional labour is a predictor of ill health among this group of workers (Laschinger and Fida, 2014).

The main challenge with measuring wellbeing is that different conclusions can be obtained depending on the number of factors that are accounted for and then controlled in the analysis, as a more robust outcome would be gained from research that controls for as many factors as possible (EU-OSHA, 2013). In this comparative thesis on studying between the self-employed and employees, it need to consider the measurement that should suit the most occupations in the UK market, thus, this study will use the two principal axes measure, namely job satisfaction and work-related stress, to examine the positive and negative workplace wellbeing.

1.4 Research Aim

Prior research on workplace wellbeing in entrepreneurship field, especially on the issue of positive wellbeing (job satisfaction) and negative wellbeing (work-related stress), mainly focuses on conducting comparative analyses of workplace wellbeing between

the self-employed and employees. A few study tested the various factors that contribute to job satisfaction and work-related stress, but the majority of them lack a strong theoretical support and model-based system perspective. Moreover, research on the relationship between job satisfaction and stress, the two significant dimensions of workplace wellbeing, is rare in the field of entrepreneurship. Thus, based on the prior researches, this thesis aims to provide a broader, deeper and more systematic picture of workplace wellbeing among the self-employed. The goal of this thesis is to examine this emerging topic of workplace wellbeing and the self-employment. The questions this thesis aims to answer include 1) differences of workplace wellbeing between the self-employed and employees, 2) factors contribute to the workplace wellbeing (both with direct effect and with indirect effect, 3) the relationship between negative workplace wellbeing and positive wellbeing, 4) coping mechanism of reducing negative workplace wellbeing and enhancing positive wellbeing.

Also, this thesis aims to contribute to theoretical, methodological and empirical knowledge. Firstly, on the aspect of theoretical contribution, this study aims to link the important psychological theories with entrepreneurship to investigate the factors that contribute and enhance workplace wellbeing at the individual level. These theories include the Self-Determination theory (SDT), Maslow's hierarchy of needs, Job-demand-control-support model, and Positive organisational behaviour. All the theories and their applications will be introduced later in this chapter and will be explicitly explained in the three empirical studies respectively, which are the following

chapters. Secondly, this thesis aims to contribute to methodology as well. This thesis as a comparative study with a big data sample, the sample selection bias is a significant problem which needs to be carefully taken care. A method called the propensity score matching method, which originates from biomedical non-experimental research, is introduced to eliminate selection bias in three empirical researches of this thesis and will combine with other statistical methods. The introduction of this method will be explained in more detail in the research methodology section of this chapter. By involving this method, this thesis aims to shed some light to the comparative research methodology in entrepreneurship field.

Thirdly, regarding practical contributions, this thesis aims to provide more insights to on how to enhance the workplace wellbeing of the self-employed and employees. With these three empirical studies, this study aims to offer systematic evidence to understand which factors of the self-employment process drive wellbeing. It offers new and valuable insights, not only for researchers who analysing and working with entrepreneurship but also for policymakers and those investigating and working with employees in established organisations, as well as for individuals and families who wish to gain the most out of their lives.

1.5 Research Objectives

The thesis consists of three independent but relevant empirical studies as the main line of investigation on the thesis topic. Each study has its specific research scope and

objectives.

The first study is 'Does Autonomy Exert Magic Power On The Low-paid Self-employed's Workplace Wellbeing: The Moderating Effect of Poverty'. This research is motivated by the fact in the UK that many self-employed workers struggle to survive on meagre incomes. Around half (49%) of the UK's self-employed are in poverty, measured on hourly basis, compared with around 22% of employees (Broughton and Richards,2016), which is defined by the UK poverty line: the 60% of median income. Regarding the purpose of an impact study of this thesis, at the individual level, in the aspect of financial impact, the empirical data has indicated that self-employment may be associated with negative outcomes, resulting in poverty and social exclusion (Felstead, Gallie and Green, 2015). Thus, this study will take this perspective to answer the question: what is the workplace wellbeing among the poor self-employed? Moreover, the first study compares the positive and negative wellbeing between the self-employed and employees. The poverty factor is introduced to investigate its restriction impact on the relationship between autonomy and workplace wellbeing, which argues about the validity of job autonomy's impact on workplace wellbeing when the self-employed are under the poverty condition.

The second empirical study is 'Do the Self-employed Experience Lower Work-related Stress? A JDCA model test'. This study takes the perspective of negative workplace wellbeing (work-related stress) and tests the job demand, job control and social supports' directly and indirectly impact on the negative workplace

wellbeing(work-related stress). Moreover, the self-employed have been classified into the self-employed with hiring employees and the solo self-employed (self-employed individual without hiring employees). This is because the workplace context may be different for these two types of self-employment. For the solo self-employed, no matter whether the workplace is located at home or flexible outside, self-employment is continually affected by family, business stakeholders and society. For the solo self-employed, workplace wellbeing is also a significant topic that can be investigated via the relationship between the solo self-employed and their connections. For the self-employed with hiring employees, the workplace context contains not only the role of the self-employed but also contains the recruited individuals. Compared with the solo self-employed, the relationship between the self-employed and their employees may change the situations of job demand, job control and social supports which may directly or indirectly affect their the workplace wellbeing. Thus the second empirical study aims to examine the factors that contribute to the negative workplace wellbeing and the differences among the self-employed with hiring employees, the solo self-employed and employees.

The third empirical study is ‘Work-related Stress and Job satisfaction of Self-employed: Coping effect of Self-efficacy’, this study tests the relationship between the negative workplace wellbeing and the positive workplace wellbeing. It also aims to examine how to cope with negative workplace wellbeing and enhance the positive wellbeing. Self-employment, temporarily or permanently, can be a lonely journey for the

individuals, which means the self-employed have the large possibility to face the challenges and difficulties alone. Thus the coping factor selected into the model focus at the intra-personal level, which helps to cope with negative stress by enhancing their capacity and skill. The self-efficacy, as a vital element of psychological capability, is introduced to study the coping mechanism of workplace wellbeing among the self-employed. Also, this study aims to investigate the differences of the coping mechanism between the self-employed and wage-paid employees.

1.6 Research Questions

The central research question of this thesis is the difference between the self-employed and employees around the topic of the workplace wellbeing. In particular, each study responds specific research questions:

Study 1: Does 'Autonomy' Exert Magic Power On The Low-paid Self-employed' Job Wellbeing: The Moderating Effect of Income.

The chapter proposes to answer two questions in this study. 1) Do the self-employed always happier (experiencing high job wellbeing) than employees when they receive low pay? 2), Does poverty exerts moderating effect on the relationship between job autonomy and job wellbeing?

Study 2: Do the self-employed experience lower work-related stress?

JDCS model test with the matching approach:

1) How's work-related stress be different among employees, solo self-employed and self-employed with hiring employees; 2) How's job demands, job control, and social support affect the work-related stress among three occupation groups.

Study3: Working related stress and Job satisfaction of Self-employed:

Coping effect of self-efficacy.

1) Do the self-employed have a higher level of job satisfaction than employees? 2) What's the relationship between work-related stress and job satisfaction? 3) Do self-efficacy can effectively moderate the relationship between stress and job satisfaction?

1.7 Research Gaps

Building on prior research, this thesis extends to reach a thorough understanding of job wellbeing of self-employment. The extension of the present study is based on the fact that personal factors affect the workplace wellbeing directly, as well as indirectly (e.g. interaction effect). The research gaps that this thesis tries to fill are displayed in Table 2. In the first study, self-employment in poverty is currently a popular policy focus but lacks academic research on that. It is important to note that job wellbeing as a crucial motivator and rewards of self-employment could be a significant reason that attracts low-paid self-employed to maintain in the self-employment rather than exit. In the first

study, the question of comparing the workplace wellbeing between the self-employed and employees will be extended by considering the context of poverty. On the other hand, job autonomy has been considered in prior research to be the main reason of high job wellbeing among the self-employed. According to the Self-determination (SDT) theory, the impact of job autonomy on job wellbeing is universally significant. To verify this universality, this study uses the poverty as a moderator to see whether it constrains the relationship between job autonomy and job wellbeing.

In the second study, it is important to note that existed literature has verified that job demand, job control and social support are significant factors contribute to workplace wellbeing among common workers. However, there is a lack of studies that compare different types of occupation groups in the field of entrepreneurship. Thus, this thesis extends the research questions by doing comparison analyses between the self-employed with hiring employees and the solo self-employed. Moreover, it is not clear how those factors exert interaction effects on workplace wellbeing, which is based on the buffering hypotheses in the Job Demand Control Support (JDCS) model and lacks sufficient empirical supports. Thus, this study aims to test this buffering hypothesis and provides new empirical evidence to contribute the validity of JDCS model.

The third study emphasises the coping mechanism of self-efficacy on the relationship between work-related stress and job satisfaction. Within the concepts of workplace wellbeing, only a hand of researchers has investigated the relationship between positive

wellbeing (job satisfaction) and negative wellbeing (work-related stress). Even though this relationship has been verified within the general organisation behaviour field by those researches, for the self-employed, it is still a puzzle. This is due to the phenomenon that the self-employed experiences a high level of job satisfaction and also have a strong possibility of experiencing a high level of work-related stress. Thus, the relationship between the positive side and negative side of job wellbeing may independent or closely relevant, or some coping factors can moderate it, which is the question the entrepreneurship field has yet not understood thoroughly. Therefore, the third study tries to fill this research gap and find out the coping mechanism of the self-employed on reducing work-related stress and enhancing their job satisfaction.

Table2 Research Gaps of three empirical studies

Study	Questions did in psychological and entrepreneurship research	Studies	Research extension	question's
1	1) Do the self-employed experience higher job wellbeing?	Amorós and Bosma, 2013; Benz, and Frey,2008; CooperandArtz,1995; Millán, Hessels, Thurik and Aguado,2013; Hanglberger and Merz,2015; Lange,2012 etc.	Do the self-employed experience higher job wellbeing when they are on low pay?	
1	2)Does job autonomy has significant impact on the job wellbeing among the self-employed	Sev ä Larsson, Strandh, 2016; Benz and Frey, 2008 etc.	Does the relationship between job autonomy and job low-income level can constrain wellbeing?	
2	1)Do the self-employed experience higher work-related stress than employees?	Lewin-Epstein and Yuchtman-Yaar, 1991; Jamal, 1997; Blanchflower, 2004; Jamal, 2009 etc.	Do the self-employed experience higher work-related stress? Moreover, differences between the solo self-employed and the self-employed with hiring employees	
2	2) Do factors contribute to work-related stress? Based on testing additive hypotheses JDC model	Hessels, Rietveld and Zwan, 2017	Do factors contribute to work-related stress? Based on testing additive and buffering hypotheses JDCS model	
3	1)The relationship between job satisfaction and work-related stress	Stamps and Piedmonte,1986; Cooper et al., 1995; Fletcher and Payne, 1980	Explore the coping effect of self-efficacy on the relationship between work-related stress and job satisfaction	

1.8 Theoretical underpinning

As noted before, entrepreneurship is a multi-disciplinary academic field; many theories have been put forward by scholars to explain the field of entrepreneurship. These theories have their roots in management, psychology, sociology, anthropology and economics. Classical psychology theory has been continually applied into entrepreneurship with increasing number year by year. For the most of the psychological theories, the subject of analysis is the individual (Landstrom, 1998). These theories emphasise personal characteristics that define entrepreneurship. For example, personality traits theory has been used to explain some of the characteristics or behaviours such as a high level of creativity and innovation, and a high level of management skills and business know-how always associated with entrepreneurs who tend to be more opportunity-driven(Ardichvili., Cardozo, and Ray,2003; Nga and Shamuganathan,2010). Based on the locus of control theory, researchers found that entrepreneurial success is closely associated with abilities of entrepreneurs and also closely with social supports from outside, by conceptualising as the internal locus of control and external locus of control. (Mueller and Thomas,2001; Hansemark, 1998). This thesis also employees several classical psychological theories and theoretical perspective of workplace wellbeing in entrepreneurship study. In the first study, two fundamental and classical theories have been applied, the first one is the self-determination theory(SDT), which was initially developed by Deci and Ryan(2000) and has been implemented and refined by scholars from many countries. The other

theory is Maslow's hierarchy of needs (Maslow, 1943), which is a world-wide applied motivational theory in psychology comprising a five-tier model of human needs, often depicted as a pyramid with hierarchical levels. Maslow stated that people are motivated to achieve certain needs and that some needs take precedence over others. In this model, it is suggested that the basic material needs are more important than the autonomy need. So based on Maslow's Hierarchy of Needs, this study aims to test the universal validity of the SDT theory, by involving a moderator-the poverty.

In the second study, the Job-Demand-Control-Supports model (JDCS) is employed, one of the most popular models in psychology, which has been used to study the relationship between job characters and work-related stress for the last 30 years. The model was established by Karasek (1979) and Johnson, Hall, and Theorell (1989), which outlines the impact of specific job characteristics (Job demand, job control, and social support) on workrelated wellbeing. In this study, an analysis with the whole picture of JDCS model will be conducted, by testing both the additive and buffering effect of the job characters on the work-related stress between the self-employed and employees.

The third study will adopt the Positive organisational behaviour perspective, which is a field has emerged from the recently proposed positive psychology approach. Among the POB criteria-meeting capacities selected for inclusion, Self-efficacy represents the best fit with all the criteria (Luthans, 2002). By involving the POB perspective to entrepreneurship, this study aims to offer a more theoretical-based and systemic

perspective in the field especially by focusing on the self-efficacy as an important psychological resource of the self-employed to cope with negative workplace wellbeing and enhance positive workplace wellbeing.

1.9 Methodology

1.9.1philsograp of methodology

This thesis is a quantitative research, which based on philosophy view of ‘empiricism’ (Leach,1990) and ‘Positivism’(Duffy,1985). Empiricism, in philosophy, is defined as the view that all theories originate in experience, that all concepts are about or applicable to issues that can be experienced, or that all rationally acceptable beliefs or propositions are justifiable or knowable via experience (Leach, 1990). Positivism, emphasises empirical data and scientific methods. This philosophy perspective holds the perspective of regularities establish the world. These regularities are detectable and conceptualised, and, thus, that the researcher can infer knowledge about the real world by interpreting and investigating it (Duffy,1985).

Based on ‘empiricism’ and ‘Positivism’, a research employing the quantitative research can presents an objective, formal, systematic process with employing numerical data to quantify or measure phenomena and produce findings it describes, tests and examines cause and effect relationships (Burns and Grove,1987) Moreover, by employing legitimate quantitative data, which is collected rigorously by applying the scientific methods and analysing critically, can enhance its objectivity, validity and reliability (ACAPS, 2012: 6).

1.9.2 The comparative method

In this thesis, the main method applied throughout the three empirical studies is the comparative analysis between the self-employed and wage paid employees. The comparison is a common research method with outstanding merits and widespread application, which plays a vital part in the most diverse branches of the humanities and social sciences alike. Firstly, the comparative approach is a mode of scientific analysis that sets out to investigate systematically two or more entities concerning their similarities and differences, to arrive at understanding, explanation and further conclusions (Azarian,2011). Secondly, the comparative analysis is worthwhile. By considering subjects, social actions and events under other contexts, the comparative analysis helps us to better understand the often taken-for-granted basis of our practices and phenomena. Moreover, the results generated by comparative study approve the significance of various methods of organising a society's issues to develop their efficiency, it also enables us to 'reflect upon our social systems and cultural ways of behaving'(May, 2011:249).Thirdly, Comparison detects the potential of revealing and challenging our less evident hypotheses and conceptions about the world. In light of this view, the comparison of the phenomenon will allow us to detect the divergent formations of the phenomenon and investigate why some have processed in similar ways while others are different ways (Azarian,2011). Lastly, a comparative approach can not only describe differences and similarities and development of typologies but also can be used to extract insights about the causal relationships responsible for the

observed similarities and differences(May 2011). In other words, the comparative analysis not only helps identify the different actual or possible paths that social processes may take but also help develop a causal theory that can explain the phenomenon. Consequently, by considering the noted advantages of the comparative method above, in this thesis, it is appropriate to apply this method to highlight the particularity of the self-employed regard with the workplace wellbeing by conducting a comparative analysis with employees. It may also reveal causal generalisations between occupation selection and workplace wellbeing to gather a deeper understanding of the issues of the workplace wellbeing and the self-employment.

1.9.3 The matching approach

‘What would happen if I had not chosen to be entrepreneurs?’ To answer this kind of question, one must consider counterfactually. The main problem is that if individuals chooses to be entrepreneurs, then there is no data on exactly what would have happened had they not decided to be entrepreneurs. Recently, Schjoedt and Shaver (2007) cast doubt on previous results by difference-of-means tests relating group averages for the self-employed and employee(without controlling for other influence). Schjoedt and Shaver (2007) argued that the methodology of difference-of-means tests may be flawed, because self-employed individuals differ from other individuals in many ways, and these differences between the different occupational groups must be controlled. Otherwise, the selection bias will be produced and will mislead the results. The reason can be statistically explained by following the common framework set out by Rubin

(1974), which uses binary variable $T_i \{0,1\}$ to represent the occupation groups. If $T_i = 1$ then subject i are the treatment group individuals, who are the target subject to study in the research (who are the self-employed in this thesis), that is, the subject is ‘treated’. If $T_i = 0$ then the subject i are control group individuals, who are employed to compare with treatment group (who are employees in this thesis). The estimated outcome of differences between the treatment group and control group on outcome variable Y in the group of treated subjects (ATT (Average Treatment Effect on Treated)) can be estimated as

$$\tau_{ATT} = E[Y_i(1) | T_i = 1] - E[Y_i(0) | T_i = 1]$$

Where $E[Y_i(0) | T_i = 1]$ refers to the possible outcome of treated subjects without intervention. However, in practice, such output cannot be obtained because we know only one outcome after intervention (the actual outcome). As such, both options are not possible at the same time. Intuitive substituting of $E[Y_i(0) | T_i = 1]$ by non-participants $E[Y_i(0) | T_i = 0]$ is likely to produce selection bias when condition $E[Y_i(0) | T_i = 1] - E[Y_i(0) | T_i = 0] = 0$ does not hold. Treatment individuals and control individuals would have different outcomes even without intervention as a result of observable and unobservable factors (Caliendo and Kopeinig, 2008). However, this selection bias can be overcome by employing Propensity Score Matching (PSM) techniques.

Rosenbaum and Rubin (1985) proposed Propensity Score Matching (PSM) to resolve the selection bias problem as it can reduce multi-dimension matching to only

one-dimension matching. PSM is based on the assumption that sample selection bias can be eliminated by conditioning on observable variables, and does so by matching each treatment subject(the self-employed) with one or more control subject(employees) with similar observable characteristics. In essence, matching models simulate the conditions of an experiment in which treatment individual(the self-employed) and control individuals(employees) are randomly assigned, allowing for the identification of a causal link between the career choice and outcome variables. Statically, PSM consists of four steps: Firstly, logistic regression is conducted to obtain propensity score by employing predicted probability (p) or $\log[p/(1 - p)]$. The dependent variable $Y = 1$, if it is treatment individual; $Y = 0$, control individuals. Secondly, check the propensity score is balanced or not between treatment and comparison groups, and check that covariates are balanced or unbalanced between the treatment and comparison groups by applying standardised differences or graphs to examine distributions. Thirdly, matching each participant to one or more nonparticipants on propensity score by the various statistical method. In this thesis, the nearest neighbour matching method is employed to produce the balanced data at the ratio 1:1 of the size of the self-employed to employees. Finally, Verifying that all the covariates are balanced across treatment and comparison groups in the matched or weighted sample and continue the other statistic analysis with the new sample.

Matching estimators are preferable because more care is taken to establish an appropriate control group when the updated sample needs to be used by other statistical

methods, like regressions. This is because the researcher is presumably interested in comparing individuals that have the same values for all covariates, multivariate regression modelling obscures information on the distribution of covariates in the treatment versus control groups. Unless there is substantial overlap in the two covariate distributions, multivariate regression estimates rely heavily on extrapolation, and can, therefore, be misleading (Ichino et al., 2008). Another advantage of matching method is that it requires no assumptions on functional forms (Hussinger, 2008). Consequently, the core concept of the matching theory is that, when examining treatment effect, the treatment sample (e.g., the self-employed group) should have similar characteristics as those of the controlled sample (e.g., employees). Within social science comparison study, other features of observance in two groups need to be roughly the same to make sure the sample is randomly determined or is exogenously given (Rubin, 1973).

By taking advantage of PSM, the number of researchers utilising the Matching approach increase continually within the management and economic area. For example, Persson (2001) used this method to test the effect of joining currency unions on trade growth of countries. Hutchison (2004) applied the matching approach to investigate the effect of IMF program participation on output growth. Hofler et al. (2004) using PSM to control for selection bias problem to study the relationship between institutional ownership and dividend payout behaviour of the firm. Thus, this approach will be employed into our updated sample establishment.

1.9.4 CFA and SEM

In social and behavioural sciences, interesting attributes such as attitudes, personality traits, job autonomy, work-related stress etc. cannot be observed directly and are often called latent variables. The influence of such variables can be assessed by multiple indicators that are subject to measurement errors. Due to measurement errors, conventional statistical methodology such as regression and ANOVA/MANOVA cannot be directly used to analyse the relationships among these attributes. By segregating measurement errors from the true scores of attributes, Confirmatory factor analysis (CFA) and Structural equation modelling (SEM) provide a methodology for modelling the latent variables directly. The methodology of CFA and SEM has enjoyed tremendous developments since 1970 and is now widely applied (Hershberger, 2003; MacCallum and Austin, 2000). The multiple indicators for a latent variable are sourced from the factor analysis (Lawley and Maxwell, 1973). Thus, CFA and SEM are often seen as an extension of factor analysis in the psychometric literature.

More specifically, Confirmatory factor analysis (CFA) is a statistical methodology applied to verify the factor structure of a set of observed variables. More specifically, CFA allows the researcher to test the hypothesis that suggests a relationship between observed variables and their underpinned latent constructs exists. The researcher uses the theoretical and empirical knowledge to produce the relationship pattern a priori and then tests the hypothesis statistically (Ullman and Bentler, 2003). Therefore, the designing of the analysis is driven by the theoretical relationships among the observed

and unobserved variables. In the first study, the CFA will be applied to conduct the multigroup analysis between three latent variables, job autonomy, job anxiety and job depression. SEM has been described as a combination of exploratory factor analysis and multiple regressions (Ullman and Bentler, 2003). On the other hand, SEM, in comparison with CFA, extends the possibility of relationships among the latent variables and contains two components: (a) a measurement model (essentially the CFA) and (b) a structural model. Moreover, two other terms are emphasised within SEM: exogenous, similar to independent variables and endogenous, similar to dependent or outcome variables. While, exogenous and endogenous variables can be observed or unobserved, depending on the suggested model. Within the context of structural modelling, exogenous variables stand for those constructs that conduct an impact on other constructs studied and are not affected by other factors in the testing model. Those constructs defined as endogenous are affected by exogenous and other endogenous variables in the quantitative model. The structural model contains the other component in linear structural modelling. The structural model presents the interrelations among latent constructs and observable variables in the proposed model as a succession of structural equations. Thus, this study will use the SEM to test the relationship between the job autonomy and workplace wellbeing. Also, the poverty will be introduced to the model as a moderator.

1.9.5 Moderated Multiple Regression

Due to the increasing significance of moderating effects, the use of moderated multiple

regression (MMR) has become pervasive in numerous management areas such as organisational behaviour, human resources management, strategy, etc. This is because many theories in management have reached a sufficient level of development and sophistication. More and more researchers are interested in investigating not only the main direct effects of independent variables on dependent variables but also their interactive effects. In other words, the existence of a moderating effect suggested that the relationship between two variables (e.g., X and Y) varies as a function of the value of a third variable (e.g., Z), labelled a moderator (Zedeck, 1971).

Moderating effects play significant roles in theories in many areas of management and the social and behavioural sciences in general (Bedeian and Mossholder, 1994). As Hall and Rosenthal implied that moderator variables are ‘at the very heart of the scientific enterprise’ (Hall and Rosenthal, 1991: 447), which support numerous theoretical developments. Numerous statistical techniques have been used to verify the presence of hypothesised moderating effects, one of these called moderated multiple regression (MMR) (Cohen and Cohen, 1983). Over the past four decades, various independent empirical analysis conducted confirmed that MMR is an appropriate and scientific method for examining the effects of moderator variables (Cohen and Cohen, 1983). Consequently, nowadays, MMR is a widely-used statistical technique for testing moderating effects, as proved by Cortina (1993), who reported that MMR was applied in at least 123 attempts to test moderating effects in the 1991 and 1992 volumes of the *Journal of Applied Psychology*. Thus in the second study, MMR will be applied to test

the moderating effect of social supports to test the buffering hypotheses of Job-Demand-Control model. In addition, in the third study, MMR will be used to verify the coping effect of self-efficacy on the relationship between work-related stress and job satisfaction.

1.9.6 Data

All the three empirical studies will use the selected sample from a massive UK dataset called Understanding Society.

Understanding Society, currently, is the largest UK Household Longitudinal Study (UKHLS). It is a panel survey consists of approximately 40,000 observed households in the United Kingdom. Observant recruited at the first round of data collection are visited annually to collect needed information start from 2008, till now 2017, it already issues six waves data. Data collection for each wave takes place over a 24-month period. Understanding Society is sponsored by the Economic and Social Research Council (ESRC) and with support from multiple government departments as well. The research leadership team is from the cooperation among the University of Essex, the London School of Economics, and the University of Warwick. The main mission of Understanding Society is providing high-level quality longitudinal data about topics covers work, health, income, education, family, and social life to help understand the long-term effects of social and economic context changes, as well as policy interventions designed to impact upon the general wellbeing of the UK population. To this end, Understanding Society collects both objective and subjective variables and

provides opportunities for researches within and across multiple disciplines including management, economics, sociology, psychology, geography, and health sciences.

The main questionnaire targets every person in the household aged 16 or over. It contains questions about baseline information, demographics, family background, ethnicity and language use; migration, partnership and fertility histories; health, disability and caring; current employment and income; employment status (for persons interviewed January-June); parenting and child care arrangements; family networks; benefit payments; political party identification; household finances; environmental behaviours; consents to administrative data linkage. One person may complete a proxy module, comprising a much-shortened version of the individual questionnaire on behalf of another; it collects demographic, health and employment information, as well as a summary income measure (Understanding Society, 2016).

Those who participated in an individual adult interview also need to complete a self-completion questionnaire. The self-completion questionnaire focus on subjective questions, especially the more potentially sensitive and more private issue. For instance, emotional wellbeing (GHQ-12) and sleep behaviour, environmental attitudes and beliefs, neighbourhood and community engagement, life satisfaction, relationship quality with partner and family (Understanding Society, 2016).

The sample for each wave of Understanding Society is issued to the public as two-year samples, each of which is restricted to the first half year of the wave. Most data is collected face-to-face via computer-aided personal interview (CAPI). Also, there are

also particular self-completion instruments for youth and adults. The youth instruments are administered on paper. The adult self-completion questionnaire was administered on paper at Waves 1 and 2 and by CASI at Waves 3, 4 and 5. From Wave 3 onwards, there was also a telephone mop-up at the end of the fieldwork period for each sample. The data of understanding and society are checked, cleaned and gone through a process of quality assurance. The quality control has been conducted via various high standard of fieldwork practices to prepare survey materials, to reach editing and coding requirements, and to ensure subjecting fieldwork progress to detailed weekly scrutiny. Moreover, an agreed set of survey-specific procedures to enable adequate response and effective data quality reinforces this working relationship. Explicit details of these, and other technical and quality control aspects of the data collection and fieldwork, coding, and data processing can be found in the Technical Reports, published on the Understanding Society website (see [http://data.understandingsociety.org.uk/.](http://data.understandingsociety.org.uk/))

In our first empirical study, the data is sourced from the Fourth Wave of understanding society (The year 2013). The total sample is 20626 individuals including the self-employed (N=2682) and employees (N=17944).

In our second empirical study, the sample is selected from those claiming themselves as being self-employed or employees and participating in the survey of both Waves 5 and 6. The used dataset consisted of 3743 observations (employees: n=1972; solo self-employed: n=1423; self-employed hiring employees: n=348).

In our third empirical study, our sample is selected by merging dataset of Wave 5 and

Wave 6 to capture all required variables. After the sample selection, the dataset consisted of 12162 observations (Employees: n=10481; self-employed: n= 1081).

All the missing data is deleted to ensure the validity and reliability of applying the dataset.

1.10 Structure of the thesis

1.10.1 Chapters structure

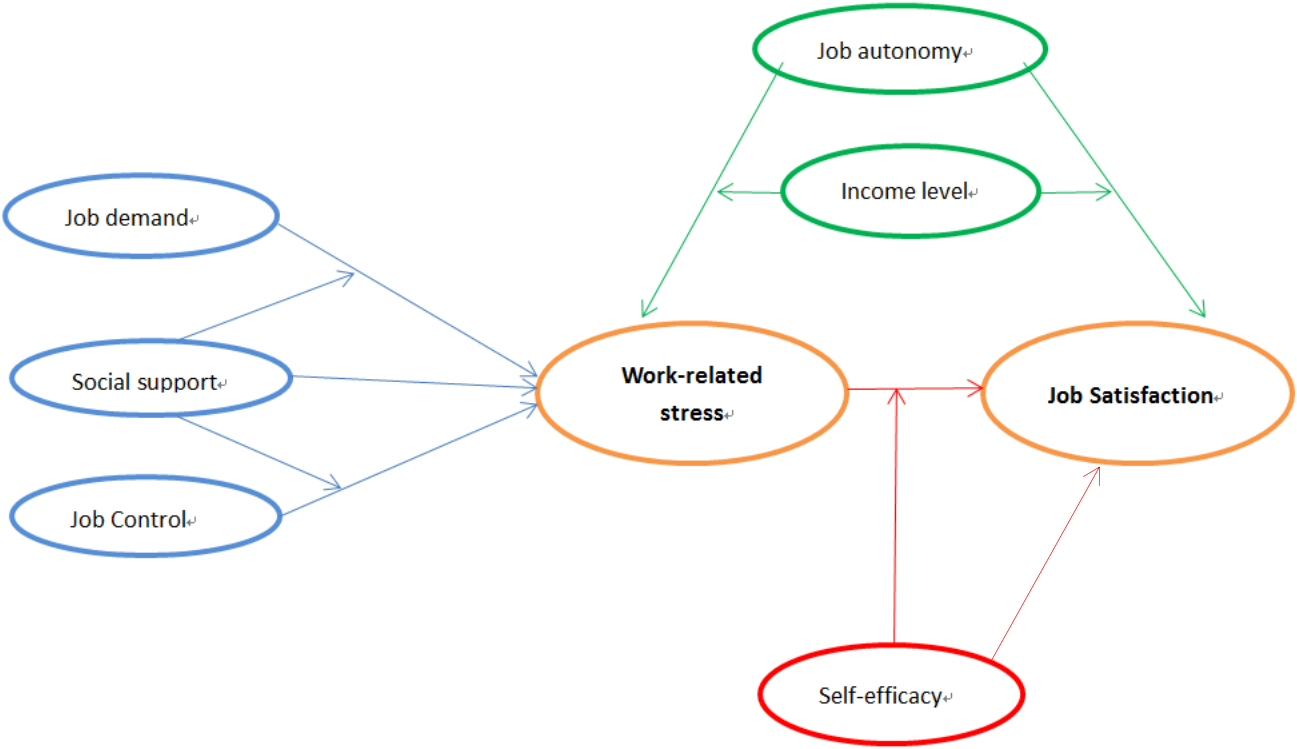
The thesis is designed by following PhD student three essays construct thesis of the University of Essex, which consists of three independent but relevant empirical studies as the mainline of investigating on the topic of workplace wellbeing and the self-employment. Plus the introduction and conclusion chapters, the thesis consists of five chapters. Chapter 1 is Introduction, Chapter2 displays the first empirical study ‘Does ‘Autonomy’ Exert Magic Power On The Low-paid self-employed’s Job Wellbeing: The moderating effect of poverty’; Chapter 3 presents the second empirical study: ‘Do the self-employed really experience lower work-related stress? JDACS model test with matching approach’; Chapter 4 discusses ‘working related stress and job satisfaction of the self-employed: coping effect of self-efficacy;’ Chapter 5 is the conclusion, contribution, implication and limitation.

1.10.2 The relationship among the three empirical studies

The issue of workplace wellbeing has long played a major role in organisational research. Workplace wellbeing is a board and complicate construct to study, which

covers numerous sub-topics. Within entrepreneurship field, researchers studying on this topic are rare, and the majority studies are sporadically and independently. It lacks a holistic and systematic driven to show the whole image. This thesis with a focus on workplace wellbeing with a combination of three empirical studies aiming to understand which factors of the self-employment drive workplace wellbeing. The structure and the interplay among three empirical analyses are displayed in Figure 1. The Negative (work-related stress) and positive workplace wellbeing (job satisfaction) are the core and dependent variables in the construct. Around these core concepts, three empirical studies will be conducted to investigate the factors of self-employment process contribute to workplace wellbeing, the coping mechanism of reducing negative work wellbeing and enhancing positive workplace wellbeing, and the relationship between positive wellbeing and negative wellbeing. The first study (displayed in green part) explores the question as to whether the universality of the significant impact of job autonomy on workplace wellbeing can be constrained by poverty, in which both the positive and negative job wellbeing are dependent variables. The second study (displayed in blue part), based on JDCS model, which explores the additive and buffering impacts of job demands, job control and social supports factors during self-employment on negative workplace wellbeing (work-related stress). The third paper (displayed in red part) investigates the relationship between negative and positive workplace wellbeing and also test the coping effect of self-efficacy on reducing negative workplace wellbeing and enhancing positive workplace wellbeing.

Figure 1 Relationships among the three empirical studies within the thesis





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**Chapter 2 Does autonomy exert magic power on the low-paid self-employed's
workplace wellbeing: The moderating effect of poverty**

2.1 Introduction

According to the Global Entrepreneurship Monitor Report 2013, ‘Entrepreneurs are among the happiest individuals across the globe when it comes to individual wellbeing and satisfaction with their work conditions’ (Amorós and Bosma, 2013:10). This report serves as a trigger of interest in the further investigation into the topic of workplace wellbeing in entrepreneurship. This is an important inquiry in current entrepreneurship field. Firstly, workplace wellbeing has been found as a strong predictor of such behaviours as workers’ commitment, motivation, absenteeism, quitting intentions, and other affective responses to aspects of the job and is closely related to the organisation’s performance or business success (Gazioglu and Tansel, 2006; Lange 2012). Secondly, when someone plans to become a self-employed person, he/she will consider the rewards of entrepreneurship. For a long time, in entrepreneurship research entrepreneurial reward has almost exclusively been defined regarding financial outcomes. While such measures are indeed important indicators of success, however, there is currently growing recognition in the field of entrepreneurship of a somewhat broader definition of ‘entrepreneurial reward’—one that regards wellbeing as important as financial outcomes. Indeed, research findings indicate that many individuals who are driven to become self-employed display more non-monetary intentions and are more caring about the influence of entrepreneurship on their wellbeings (Baron, 2012; Cassar, 2007).

In explanation of the job wellbeing of the self-employed, numerous studies have tried to link, compare and disentangle the determinants of workplace wellbeing. A good number of research has found that the self-employed have a higher level of job satisfaction due to their job characters (Le Blanc et al., 2001). Some of these studies have applied the SDT (self-determination theory) in their investigation. SDT suggests that autonomy is one of the three basic psychological needs and has a close relationship with one’s wellbeing. Entrepreneurship research appears to suggest that job autonomy is the main source of high

workplace wellbeing among entrepreneurs. This study will also apply SDT theory to test the significance of job autonomy's effect on workplace wellbeing.

Methodologically, there are two ways to test the significance of a variable's effect on the other one. One popular way to verify the importance of job autonomy to individual's workplace wellbeing is to test it across different contexts (occupations, gender and country) (Lange, 2012). The other way to test the importance of the job autonomy is to examine whether its contribution to wellbeing is constrained by another factor, for example, the poverty. In other words, when the need for a monetary reward of entrepreneurship is threatened, do the self-employed still experience higher workplace wellbeing than employees? If the answer is yes, is job autonomy still the major contribution of this difference. Empirically, those who plan to take entrepreneurial activities will not only care about their prospect of success but will also wish to assess the difficulties facing them arising from financial difficulties. Indeed, it is a lot easier to stay happy in a positive financial situation than a negative one. For many self-employed who are creating and running new ventures, a financial problem like poverty can be a more sensitive issue to them than to 'stable-working' employees, due to high-risk, uncertainty and complexity of self-employment (Carland et al.,2002). As a matter of fact, the financial situation of the self-employed is less positive than people expected previously. As Meager (2008,200) concludes, 'the presence of self-employed spells in the previous work history does increase chances of poverty, low savings levels and poor pension entitlement in later life'. Also, there is evidence in practice, according to the SMF (Social market foundation) (Broughton and Richards, 2016) that low-paid self-employment (Income below the National Living Wage) is rising yearly. Around half (49%) of the UK's self-employed are in the poverty situation, compared with around a fifth of employees (22%). Also, they found, the low-paid self-employed have few other sources of income to rely on aside from their earnings. Moreover, the low-paid self-employed are more likely to live in low-income households than their

employee counterparts. PenaCasas and Latta (2004) found that the poverty rate (<60% of median income) was higher among self-employed than regularly employed in all EU-15 countries. On average, 6% of the employed were poor; while as many as 14% of the self-employed were poor. Thus, does the poverty of the self-employed affect workplace wellbeing, especially moderate the relationship between the job autonomy and workplace wellbeing? According to Maslow's Hierarchy of Needs (Maslow, 1943, 1971), autonomy is defined as one kind of self-esteem needs on the second high level. A more fundamental need described in the Maslow's hierarchy is security and material need. As Maslow explained, human needs follow a hierarchical structure. Maslow's theory implies that when one's financial need cannot be satisfied due to low income, the charming of autonomy associated with self-employment may be less appealing. In other words, 'autonomy' may lose its magic power for the low pay self-employed.

In conclusion, current research suggests that the self-employed are happier than employees (Benz and Frey 2004), largely due to job autonomy that the self-employed enjoy (Epstein et al., 1990). However, this line of research has focused more on the positive financial situation but rarely pays attention to the negative one. Therefore, this study wishes to fill this significant gap in the research for a better understanding of the workplace wellbeing of the self-employed who live in poverty. This thesis will do so by undertaking a comparison analysis between the self-employed and employees to uncover the reasons behind the differences of workplace wellbeing between the two groups. Thus, by drawing on the theories of SDT and Maslow's hierarchy of needs, this thesis aims to answer two questions in this study. Firstly, are the self-employed always happier (experiencing higher workplace wellbeing) than employees when their income are below the poverty line? Secondly, does the poverty exert a moderating effect on the relationship between job autonomy and workplace wellbeing?

2.2 Literature Review

The topic of wellbeing has gained a great attention in social sciences and economics. There are two main streams in wellbeing research in recent years. The first stream of research is concerned with life wellbeing, which is about an individual's overall life satisfaction or happiness (Plagnol,2010). The second stream focuses on the analysis of job-related wellbeing in the workplace, better known as 'workplace wellbeing', which is one dimension of overall life wellbeing. Workplace wellbeing has both positive and negative dimensions, which align with Herzberg's well-known two-factor theory (Herzberg,1965) a half century ago, while job satisfaction is part of the positive facet of it. Warr (2002) suggested a model which can be used to examine workplace wellbeing along three dimensions, namely pleasure-displeasure, anxiety-comfort, and enthusiasm-depression. Pleasure-displeasure refers to a person's level of job satisfaction. On the anxiety-comfort dimension, feelings of anxiety are the result of low pleasure and high mental arousal, whereas comfort is the result of low arousal and pleasure. On the enthusiasm-depression dimension, depression indicates low pleasure and low mental arousal, whereas enthusiasm indicates high pleasure and high mental arousal. However, in most research on entrepreneurship, workplace wellbeing is commonly measured as job satisfaction, which is only the positive side, falling short to capture the whole image of workplace wellbeing (Clark and Oswald, 1994). In the entrepreneurial field, the research on workplace wellbeing is still emerging, and there is a dearth of empirical evidence about the relationship between workplace wellbeing and entrepreneurial activities at the individual level (Carree et al., 2011). The major studies seem to suggest that the self-employed enjoy higher levels of job satisfaction, as compared with employees. However, only a smaller number of literatures are devoted to identifying specific explanatory factors. As mentioned earlier, some studies tended to concur that job autonomy accounts for higher job satisfaction of the self-employed. As Benz and Frey stated (2008,362) that 'individuals derive procedural utility

from being self-employed because it gives them a higher measure of self-determination and freedom.’ On the other hand, with the policy focus is now firmly on the lower income self-employed group, research has moved attention to this specific occupational group (Broughton and Richards, 2016; Meager,2008; PenaCasas and Latta,2004 etc.) as the self-employed have a greater possibility of staying in a lower-paid financial situation. However, researches only addressed the financial results of entrepreneurship, workplace wellbeing as one of the significant entrepreneurial rewards has been largely ignored. Therefore, this study responds to this research gap and investigates how the interplay between job autonomy and poverty affects the self-employed’s workplace wellbeing.

2.2.1 Job autonomy and self-employment

Job autonomy has been defined as ‘the extent to which a job provides freedom, independence and discretion in planning the work and determining how to undertake it’ (Mullins, 2007:203). In entrepreneurship and management, the explanation of how job autonomy promotes the workplace wellbeing can be seen in two perspectives.

Firstly, autonomy can be seen as a job character. In the Job Characteristics Model, Hackman (1980) proposed that autonomy be one of the five ‘core’ job characteristics (skill variety, task identity, task significance, autonomy, and feedback) that affect five work-related outcomes (motivation, satisfaction, performance, and absenteeism and turnover). It implies that job autonomy will allow the self-employed to have independence and flexibility to run their business and thus increase their workplace wellbeing. In entrepreneurship research, empirical evidence to date has shown that autonomy is one of the most distinguished job characteristics valued by the self-employed. Schonfeld and Mazzola’s (2015) qualitative research shows that the longtime self-employed participants expressed more frequently an appreciation for the autonomy their jobs afforded (n = 10, 23.3%). By autonomy, eight (14.8%) individuals

mentioned that self-employment gave them flexible hours, while nine (16.7%) appreciated opportunities to not work in an office by working at home or outdoors. Also, Lang (2012) used the data from European Social Survey 2006 and found that job Autonomy (Allowed to decide how daily work is organised and Allowed to influence organisation's policies) is the only job trait that shows statistically significance of differences between the self-employed and employee (compared to other traits like creativity, sense of achievement, willing of taking adventures, optimistic, positive and depressed about myself).

Secondly, autonomy can be seen as a job motivator. The most research adopted this perspective by applying the core principle of self-determination theory. In this theory, autonomy is one of three basic psychological motivators (Autonomy, Competence and Relatedness) that can promote one's workplace wellbeing (will be explained more specifically in the next part). For example, in a study conducted in Bulgaria and the United States, Deci et al. (2013) assessed the satisfaction of employees' needs for competence, autonomy, and relatedness at work and found direct positive relations in both countries between the degree of need satisfaction and both work engagement and wellbeing on the job. Baard, Deci, and Ryan (2012) found relations between satisfaction of these needs and employees' performance evaluations. In entrepreneurship research, several empirical papers show that autonomy (also referred to as independence or freedom) is an important motivator for choosing to be the self-employed (Van Gelderen and Jansen, 2006). Block and Koellinger (2009) suggested that the process of being a self-employed provides enjoyment over and above the material success. Thus, the fulfilment of job autonomy needs can contribute to one's workplace wellbeing. This study will adopt this perspective and use SDT theory to verify the significance of the value of job autonomy in workplace wellbeing.

2.2.2 Literature on the significance of value of job autonomy on workplace wellbeing

The value of job autonomy in job wellbeing among the self-employed can be defined in two approaches.

The first one is to examine the relationship between job autonomy and job wellbeing across different contexts, different nations and culture. The contribution of job autonomy to higher job wellbeing has been consistently found in 23 OECD countries (Benz and Frey, 2003), in the United States (Kawaguchi and Daiji, 2002), Canada (Finnie and LaPorte, 2003), Belgium, China and Peru (Chen et al., 2015). Among the different occupations, for example, the significance of job autonomy in workplace wellbeing has been verified among nurses (Faraz, 2017), teachers (Chebet, 2016), retail employees (Ji, Park, and Kim, 2015), higher education employees (Nadler, Voyles, Cocke, and Lowery, 2016) and the self-employed (Sev ä Larsson, Strandh, 2016).

Besides testifying the importance of job autonomy across different contexts, the second approach is to examine whether another factor constrains its contribution to workplace wellbeing, for example the poverty. In other words, is job autonomy related to workplace wellbeing even when people received low paid income and/or is the effect of job autonomy dependent upon satisfaction of their income? This approach is normally called as moderating test. Currently, in the psychological field, there is a particular interest in testing the interplay between SDT theory and the Maslow's hierarchy. In Maslow's theory, autonomy and two other basic psychological needs can be constrained by material needs, which some refer to it as security needs (López-Rodríguez and Hidalgo, 2014). However, a handful of studies pay particular attention to other needs that constrain the effect of basic psychological needs in SDT but fail to verify. Tay and Diener (2011) recently examined the interplay between satisfactions of psychological needs and needed for safety and did not find systematic evidence for an interaction between security needs and psychological need satisfaction in the prediction of

wellbeing. Filak and Pritchard (2008) also researched the interaction of job autonomy and material Needs in the prediction of job motivation among internship students and found that money did not matter while students enjoyed their jobs during the internship. Chen et al.'s (2015) research also suggested that the associations between psychological need satisfaction and wellbeing cannot be moderated by finance factors, like job income. In the entrepreneurship field, the moderating approach has been widely used to test the significance of an independent variable on a dependent variable, for example, Lange (2012) tested the moderating role of personality between job autonomy and job satisfaction. Jamal (1997) tested whether marriage status constrained the job stress's effect on the self-employed' mental health. Jamal and Badawi (1995) used age as a moderator to test the effect of Job stress on the quality of working life of self-employed immigrants. Thus, this study will also take this approach to test the moderating role of poverty to verify the significance of job autonomy on workplace wellbeing and further our understanding of the interplay between SDT theory and Maslow's hierarchy.

2.3 Theory and Hypotheses

2.3.1 Self-determination theory (SDT): Job Autonomy and Workplace wellbeing

The Self-Determination Theory (SDT; Deci and Ryan, 2000; Vansteenkiste, Niemiec, and Soenens, 2010) specifies three fundamental psychological needs - relatedness, competence, and autonomy - that sustain intrinsic motivation, facilitate internalization of extrinsic motivation, and promote overall positive growth, development, and wellbeing (Deci and Ryan, 2012). In the SDT theory, needs for autonomy refers to experiences of volition and self-endorsement as opposed to feelings of coercion and pressure (Deci and Ryan, 2012). It means that autonomy represents an inner endorsement of one's actions – the sense that one's actions emanate from oneself and are one's own (Deci and Ryan, 2000). Autonomy pertains to striving towards the development and realisation of personal goals, values and interests (Assor,

Kaplan and Roth, 2002). Positive effects of autonomy of emotional demands on individual's wellbeing have been found in many types of research (Le Blanc et al., 2001) related to a variety of wellbeing outcomes (e.g., life wellbeing and workplace wellbeing), behavioural outcomes (e.g., persistence, performance) and relational outcomes (e.g., secure attachment) across a variety of life domains, including parenting, education, work, healthcare, and psychotherapy (Vansteenkiste, et al., 2010). In the field of entrepreneurship, SDT theory has also underpinned many studies on the relationship between job autonomy, entrepreneurial intention and workplace wellbeing. Research on entrepreneurial motivation shows that it is not financial gain, but autonomy that is most often mentioned or rated as the most important motive for starting a business (Shane, Locke and Collins, 2003; Van Gelderen and Jansen, 2006). According to Gibb (2002:136), 'we live in a society where we increasingly need the capacity to cope with, and enjoy, an enterprising way of life. This way of life is characterised by uncertainty, change, and complexity on the one hand, and freedom, individual responsibility, and the opportunity to reap the fruits of one's labour'. On the other hand, Gibb claims that more and more people are taking part in this enterprising way of life as a result of several powerful trends in how individuals relate to the state, organisations, and other individuals. Moreover, autonomy is not only a dominant entrepreneurial motivation but also a dominant source of entrepreneurial satisfaction. Among the many empirical results from different organization levels (Schjoedt and Shaver, 2007), different culture (Benz and Frey, 2008) or different types of business owned (both owners of businesses employing others and independent contractors have higher satisfaction scores), it is noted that the level of autonomy can to a large extent explain difference among individuals of workplace wellbeing experience (Benz and Frey, 2008; Lange, 2012; Schjoedt and Shaver, 2007).

Thus, *H1: job autonomy has a positive or negative relationship with workplace wellbeing*

H1a: job autonomy has a negative relationship with job anxiety

H1b: job autonomy has a negative relationship with job depression

H1c: job autonomy has a positive relationship with job satisfaction

As noted before, the universality of SDT is verified across different contexts, including the different occupations. Many studies in entrepreneurship did comparison analysis between self-employed individuals and employees, which showed that the self-employed are more satisfied with work (Benz and Frey,2008). This is surprising since the self-employed were found to earn lower wages (Hamilton 2000) or face a particular unequal income distribution often with low income (Shane,2008). The explanation could be that self-employment offers non-monetary job aspects such as work autonomy which individuals appreciate. Firstly, owning large extent of job autonomy has almost been recognized as a significant aspect to define the self-employed from employees. Consisting with the SDT theory, which suggests the greater the job autonomy ones experience, the higher the workplace wellbeing they own. Research on entrepreneurial motivation shows that it is not financial gain, but autonomy that is most often mentioned or rated as the most important motive for starting a business (Shane, Locke and Collins, 2003; Van Gelderen and Jansen, 2006), According to Gibb (2002:136), ‘we live in a society where we increasingly need the capacity to cope with, and enjoy, an enterprising way of life. This way of life is characterised by uncertainty, change, and complexity on the one hand, and freedom, individual responsibility, and the opportunity to reap the fruits of one’s labour’. On the other hand, Gibb claims that more and more people are taking part in this enterprising way of life as a result of several powerful trends in how individuals relate to the state, organisations, and other individuals. Comparative empirical evidence noted that, the self-employed have a larger extent of job autonomy than employees (Lang,2012), which may contribute to a higher workplace wellbeing of the self-employed. This view is supported by Blanchflower and Oswald (1998, 46), who contend that ‘individuals get a non-pecuniary benefit from being their boss.’ Moreover, Hamilton (2000) has shown that,

except for the highest 25% of entrepreneurial incomes, remaining in a wage-producing job (or moving back to it) makes more economic sense for the individuals than starting a new business. Thus, utility-maximizing individuals who switch from employment to self-employment may be gaining something in exchange for the income they forgo: the usual explanation is ‘wellbeing.’ Therefore, it is logical to infer that even living in poverty, as long as the self-employed experience higher job autonomy, they experience higher workplace wellbeing. This aims to respond the first question, do the self-employed always feel happier (experiencing high workplace wellbeing) than employees, when their incomes are below the poverty line?

Hence, it is posited that

H2: when individuals’ incomes are below the poverty line, the self-employed have higher job autonomy and higher workplace wellbeing than employees (inter-group difference)

H2a: when individuals’ incomes are below the poverty line, the self-employed have higher job autonomy than employees (inter-group difference)

H2b: when individuals’ incomes are below the poverty line, the self-employed have lower job anxiety than employees (inter-group difference)

H2c: when individuals’ incomes are below the poverty line, the self-employed have lower job depression than employees (inter-group difference)

H2d: when individuals’ incomes are below the poverty line, the self-employed have higher job satisfaction than employees (inter-group difference)

2.3.2 Moderating effect of Poverty: Interplay between SDT and Maslow’s hierarchy of needs

In addition to examining the universality importance of job autonomy in individual’s workplace wellbeing across different context, the other way to test the importance of job autonomy is by examining whether its contribution to wellbeing is constrained by another

factor, here the poverty is introduced.

Maslow's hierarchy of needs (1943, 1971) posits that a hierarchy of needs motivates individuals. The basic level is security needs, following by higher levels of social needs, then self-esteem, culminating needs for self-actualization. In the hierarchy model, Maslow described one of security needs as the need to have sufficient material resources for basic survival and as the need to avoid poverty. Few people would doubt that humans require some material necessities to feel safe (Kasser and Ahuvia, 2002; Maslow, 1971) and several strands of research suggest that income as the major source of living material is especially critical for wellbeing when it helps to avoid poverty and to sustain material resources for basic survival (Diener and Seligman, 2004). Prior research has already verified that one's income status is highly related to their wellbeing due to insufficient work income will lead to lacking food, shelter, heat, and inability to pay bills and family distress (Vinokur and Schul, 1997). For example, people with wage under the poverty line (Jackson et al., 2000), and even loss of jobs (Luhmann, Hofmann, Eid, and Lucas, 2012) are result in low wellbeing.

In the Maslow's hierarchy of needs, autonomy is identified as a kind of self-esteem need in the second high level of needs, which above the security needs. Maslow (1943) maintained that striving for physical safety may lead people to overlook their psychological needs. Specifically, based on his hierarchical need model, he argued that 'the appearance of a need rests on other proponent needs; needs or desires must be arranged in hierarchies of prepotency' (Maslow,1943:91). Because the need for safety is at a lower level in the hierarchy, people's functioning may become dominated by the pursuit of financial security need satisfaction as long as the financial need remains unfulfilled. Thus, the potency of the higher-level psychological needs may get reduced if the lower-level needs are not satisfied.

However, both Maslow and SDT failed to propose very specific predictions about the interplay between three basic psychological needs and the security need, as well as their interaction

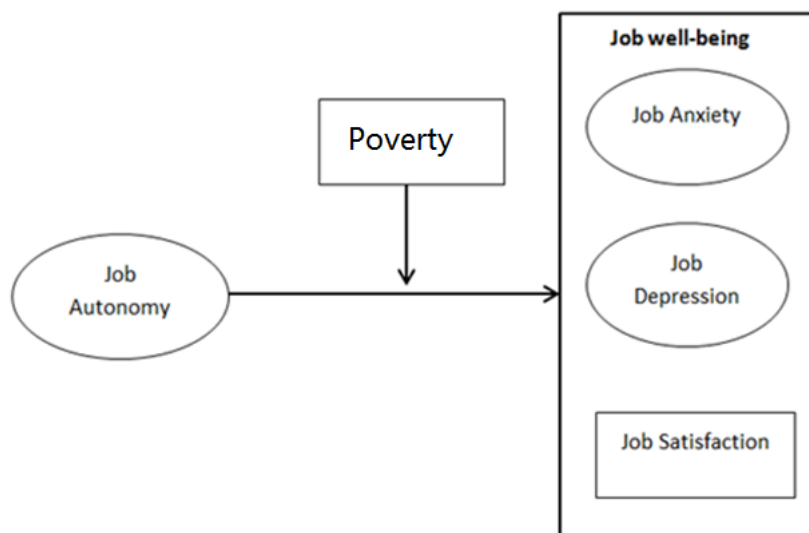
effect on wellbeing. One way to interpret Maslow's model is that the financial/physical/material need is more fundamental when compared to the psychological needs, as the latter needs are situated higher up in the Maslow's hierarchy of needs pyramid. Thus, from a hierarchical-need perspective, the effect of psychological need satisfaction may be constrained by income status. Technically, the constraining role of income on workplace wellbeing may manifest in this way: individuals deprived of financial security satisfaction may not benefit from the satisfaction of higher-level psychological needs as much as those who have satisfied their financial security need, which suggests that individual income may play a **moderating** role in the association between psychological need satisfaction and wellbeing. Thus we build a moderating effect model of poverty to investigate the role of financial security in the relationship between the self-employed and employees (see in Figure 1).

H3: poverty moderates the relationship between job autonomy and workplace wellbeing

H3a: poverty moderates the relationship between job autonomy and workplace wellbeing in the self-employed group, thereby suggesting that the relationships will be different for the self-employed with higher income and those who exhibit lower income (intra-group difference)

H3b: poverty moderates the relationship between job autonomy and workplace wellbeing in employee group, thereby suggesting that the relationships will be different for employees who exhibit higher income and those who exhibit lower income (intra-group difference)

Figure 2 Model of moderating effect of poverty on the relationship between job autonomy and workplace wellbeing



2.4 Data and Methods

2.4.1 Methods

Regarding methodology, this study will conduct the research into three steps.

Firstly, a comparable data pool is established by using the propensity score matching approach. It will classify them into four groups by observer's job (the self-employed:1, employees: 0) and by observer's financial status (1: poverty, 0:non-poverty).

Secondly, the multiple-group analysis is used to seek the mean differences on job autonomy, job anxiety, job depression and job Satisfaction among 4 groups. This aims to test *H2: when individuals incomes are below the poverty line, the self-employed have higher job autonomy and higher workplace wellbeing than employees*, and to answer the First question, do the self-employed always feel happier (experiencing higher workplace wellbeing) than employees

even they are in poverty?

Finally, to test *H1: job autonomy has a positive relationship with workplace wellbeing, and H3: poverty moderates the relationship between job autonomy and workplace wellbeing*, the study will conduct a SEM pathway analysis between job autonomy and workplace wellbeing among 4 groups, to investigate the changes of this relationship along with different level of financial strain. Then, the interaction term (poverty*Job Autonomy) is introduced to test the moderating impact of financial strain on the relationship between autonomy and job satisfaction.

2.4.2 Data and Measurements

The Understanding Society Panel Survey is the largest longitudinal survey of private households in Great Britain that contains information on various areas of the respondents' lives, ranging from income to household consumption, education, health, but also social and political values. The data is sourced from the Fourth Wave of Understanding Society (The year 2013). This dataset also covers a rich variety of employment status information for a representative sample of the British population and is used widely in the British research in the workplace (Hughes, and Kumari,2016; Wheatley, 2016). The total sample is 20626 individuals including the self-employed (N=2682) and the employees (N=17944).

Workplace wellbeing, the dependent variable. To address Warr's model (2002), this study, Workplace wellbeing is measured by three constructs: job satisfaction (pleasure-displeasure), job anxiety (anxiety-comfort) and job depression (enthusiasm-depression). All items to measure the variables are selected from the job satisfaction and working condition modules in the fourth wave questionnaire. The question measures job satisfaction is: 'how dissatisfied or satisfied are you with your present job overall?' It is effectively tracking an individual's job satisfaction on a seven-point likert scale, ranging from 'not satisfied at all' (1) to 'completely

satisfied' (7). Job-related anxiety and depression were measured by scale consist of two three-item subscales (all variable measurements are listed in Table 1). Both scales use a likert-type response format and have demonstrated acceptable reliability and validity. Kerr, McHugh and McCrory (2009) have used this measurement to test job stress and wellbeing.

Job Autonomy, the independent variable, is measured by a five-item scale from the work condition module of understanding society 4th wave, This scale was originally designed for Workplace Employment Relations Survey (WERS, 2004) to test the employees' control power on the five aspects of their jobs: How the work is done; The order in which tasks are carried out; The pace of work; The tasks done in the job; Start and finish times (see Table 1).

Poverty, the moderator, in this study, both the self-employed and employees are grouped by the poverty line. Similar to the study conducted by Broughton and Richards (2016), the threshold for poverty is 60% of median earnings of the population. This is also the threshold that is used in many studies and policy reports to measure poverty. In previous research, both monthly pay and hourly pay are adapted to measure poverty. Consistent with study of Broughton and Richards (2016), the monthly income is applied to measure poverty as it can be seen as better and more stable reflecting the total earnings that individuals have to spend. In 2012/13, according to ONS, 60% of median monthly gross employee pay in the UK was £1,040. In this study, this number is used as the threshold to create the dummy variable-poverty. Individual with monthly income lower than £1,040, has been taken as poverty, coded with '1', and individuals with monthly income higher than £1,040, has been taken as non-poverty, coded with '0'.

Demographic variables include age, sex, marital status and education. Since these variables may confound the results, both variables are included in the model as well. For instance, women tend to report greater job satisfaction than men, and they also tend to report more psychosomatic symptoms (Jamal and Badawi 1995). Similarly, Jamal (1997) noted that age

might play an important role: older people report more health problems than younger people do. Moreover, higher education may enlarge individual's employment opportunity and hence enhance the chance to find a more satisfying job. The single person experiences higher job satisfaction due to the lack of family-work conflicts (Zimmerman, 2005). Therefore, from previous research, all these demographic variables have significant associations with workplace wellbeing. All these variables need to be controlled for in the matching approach to establishing a comparable dataset, which will be explained in the next part.

All the variable measurement has been concluded in Table 3

Table 3 Variable Measurement

	Item	Variable label	Scale
Workplace wellbeing			
Job satisfaction	1	Job satisfaction	1: completely dissatisfied to 7: completely satisfied
Job Anxiety	JA1	feels tense about job	1: never to 5: all the time
	JA2	feels uneasy about job	1: never to 5: all the time
	JA3	feels worried about job	1: never to 5: all the time
Job Depression	JD1	feels depressed about job	1: never to 5: all the time
	JD2	feels gloomy about job	1: never to 5: all the time
	JD3	feels miserable about job	1: never to 5: all the time
Job Autonomy	aut1	autonomy over job tasks	1: none to 4: a lot
	aut2	autonomy over work pace	1: none to 4: a lot
	aut3	autonomy over work manner	1: none to 4: a lot
	aut4	autonomy over task order	1: none to 4: a lot
	aut5	autonomy over work hours	1: none to 4: a lot
Poverty	1		1: poverty to 0: non-poverty

2.4.3 Matching approach

Table 4 Summary Statistics

		the self-employed	employees matching	before	T-test p-value	χ^2 p-value	employees matching	after	T-test p-value	χ^2 p-value
N		2682	17944				2682			
Age	mean	47.72	42.57		0.00		47.65		0.80	
	SD	11.85	11.81				11.73			
Sex	male%	0.64	0.45			0.00	0.64			0.88
Education	degree	0.32	0.33			0.00	0.31			0.44
	other degree higher	0.12	0.14				0.13			
	degree A-level	0.22	0.22				0.21			
	GCSE	0.20	0.21				0.20			
	other qualification no qualification	0.09	0.07				0.09			
		0.06	0.04				0.05			
Single	yes%	0.23	0.28			0.00	0.22			0.36
Personal income	mean	2420.10	2314.25		0.04		2441.48		0.70	
	SD	2637.20	1632.34				1652.49			

The matching approach selects a sub-data pool from the control group to create a mirror image of the treatment group by control some key characters. Here the key characters also called the demographic variables are highly related to dependent variables, which may affect the judgments of group comparison (see Table 5). The computer selects the observation by calculating the shortest distance between treatment group and control group, which is also called the nearest neighbour matching. The same approach has been applied in the essay, ‘Life satisfaction and self-employment: A matching approach’ (Binder and Coad, 2013). This study also use the Propensity score matching (Nonparametric Pre-processing for Parametric Causal Inference), which is a statistical technique in which a treatment case is matched with one or more control cases based on each case’s propensity score to double check two groups are matched (see in Figure 3). To be more specified, this study control the rationale of the treatment group population to control group population group as 1:1, so that is 2628(the self-employed): 2628 (employees). After matched, it is obviously can see that the

demographical differences has been largely reduced, the results of T-test and Chi-square test p-values are revealed in Table 4, none of them is significant different in demographic variables between the self-employed and employees. Also, the distribution of propensity scores tends to similar between two groups after matching(see in Figure 3).

Table 5 Correlation Matrix

	Job satisfaction	JD1	JD2	JD3	JA1	JA2	JA3
Age	0.06***	-0.09***	-0.07***	-0.06***	-0.04***	-0.07***	-0.08***
Gender	0.03***	0.07***	0.02**	0.05***	0.02**	0.02**	0.02*
Married	-0.03***	0.01*	0.02***	0	0.03***	0.03***	0.02***
Education	0.04***	-0.12***	-0.07***	-0.12***	0	-0.02**	0.02***
Personal Income	0.05***	0.07***	0.03***	0.06***	-0.03***	-0.02*	-0.04***

*** p<.001
 ** p<.01
 * p<.05

Figure 3 Distribution of Propensity Scores

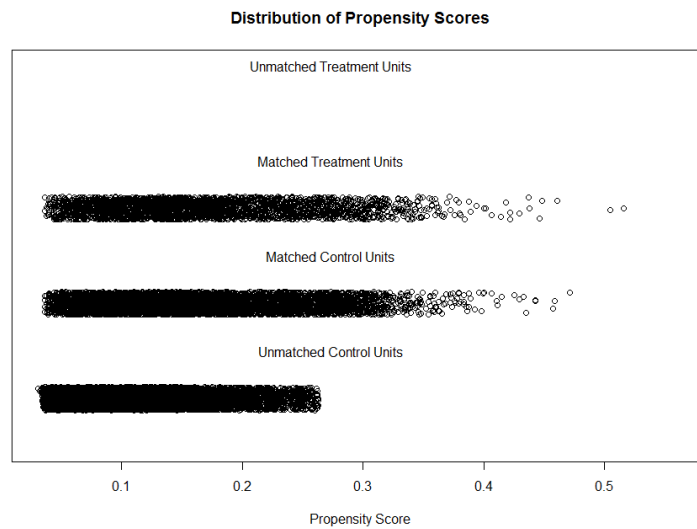


Table 6 Financial Situation and Income Differences among Different Groups

	Observation	Personal Income(GBP)
Group1 (the self-employed in poverty)	838	581.06
Group2 (employees in poverty)	339	726.75
Group3 (the self-employed without poverty)	1842	3258.55
Group4 (employees without poverty)	2341	2707.02

From the Table 6, results indicate that the distribution of income of the self-employed is more polarised than employees. The mean of income among lower-paid the self-employed is almost one-third off than it among employees; (the self-employed in poverty: £581.06, employees with poverty: £726.75). However, the share of the low-paid is dramatically larger in the self-employed' group, which accounts for 31.2%, while the in the employee's group, the number is 12.6%.

2.4.4 Multiple-group Analysis

In this study, the conceptual model (see in Figure2) encompasses three latent variables. They are Job Autonomy, Job Anxiety and Job depression. To test the validity and reliability of each latent variable, this study uses the exploratory factor analysis (EFA). The test result shows that setting three latent factors are sufficient (See in Table 7). The chi-square statistic is 244.32 on 25 degrees of freedom. The p-value is below 0.01. All the coding for Variables measurement is described in Table 2.

Table 7 Factor Analysis

	Factor1	Factor2	Factor3
aut1	0.77		
aut2	0.79		
aut3	0.84		
aut4	0.81		
aut5	0.59		
JA1		0.66	
JA2		0.76	
JA3		0.71	
JD1			0.66
JD2			0.77
JD3			0.77

Measurement equivalence will be tested by using multiple-group comparisons with nested models. Out of the variety of possible fit indices, this study will present the chi-square statistics, the comparative fit index (CFI) and the root mean square error approximation (RMSEA) (Steiger, 1989). Although values greater than .90 are considered to represent a good fit in terms of the CFIs and values greater than .80 are considered acceptable. Although values greater than .80 are considered acceptable, the RMSEA should be less than .05 for a good fit and less than .08 for a still reasonable fit of the data to the model (Browne and Cudeck, 1993). This study will also use Δ CFI as an indicator in the comparison of models. According to Cheung and Rensvold (2002), values greater than 0.01 indicates a significant drop in fit (see Table 8). The multiple-group comparison showed a good fit, indicating that model 4 (very strong invariance) can be accepted for all versions (see Table 8). Under the constraint of equal factor loadings (measurement weights), Intercepts and means, a significant increase of the chi-square statistic could be observed, although all other fit statistics point toward a satisfying fit for the multiple-group comparison. The assumption of equal factor variances is also supported by the Δ CFI.

Table 8 Multiple-Group Comparisons of Measurement Invariance

	χ^2	<i>df</i>	<i>p</i> -value	CFI	RMSEA	BIC	Δ CFI
Model 1: configure invariance	878.54	294.00	0.00	0.99	0.04	210944.48	
Model 2: weak invariance (equal loadings)	1198.75	334.00	0.00	0.98	0.04	210905.01	0.01
Model 3: strong invariance (equal loadings + intercepts):	2279.91	374.00	0.00	0.96	0.06	211626.48	0.02
Model 4: equal loadings + intercepts + means	4135.09	394.00	0.00	0.92	0.08	213301.82	0.04

2.4.5 Moderating effect analysis

In this study, the SEM approach, put forward by Marsh, Wen, and Hau (2004), is used to test the moderating role of financial strain on the relationships between Job autonomy and workplace wellbeing dimensions. A series of SEM pathway analysis are conducted among three different groups (whole dataset, the self-employed and employees) to test the significance of job autonomy's association with workplace wellbeing (see Table 10). ANOVA is used to test the difference among models (Table 11). A summary of Goodness of model fit has been manifested by testing Chi-square, the degree of freedom, CFI, TLI, RMSEA, SRMR. For the CFI and TLI values greater than .90 are considered to represent a good fit regarding the CFIs, and values greater than .80 are considered acceptable. Although values greater than .80 are considered acceptable, the RMSEA should be less than .05 for a good fit and less than .08 for a still reasonable fit of the data to the model, and Values for the SRMR range from zero to 1.0 with well-fitting models obtaining values less than .05 (Byrne,2013), however values as high as 0.08 are deemed acceptable (Hu and Bentler, 1999)(see Table 11).The moderating effect test is conducted by introducing interaction term (Job Autonomy* Poverty) into the SEM model and has been tested in three groups (the whole dataset, the self-employed and employees) as well.

2.5 Results

2.5.1 Multiple group Analysis

With a strong constraint on loadings and Intercept, this study measures mean differences of three latent variables (Job Autonomy, Job Anxiety and Job depression) to investigate the hypothesis among four groups. Firstly, this study checks the differences

of latent means among the self-employed groups between the lower-income and higher-income self-employed, this study sets the group 1 as the baseline group, which is the self-employed with income below the poverty line, to compare with group 3. The results in Table 9 revealed that job autonomy has no significant difference in inter-groups of the self-employed ($p > 0.05$). In the employee group, job autonomy of individuals with higher income is significantly higher than the employee living in poverty ($p < 0.05$). Then, this study make the comparisons between the self-employed and employees at the each financial levels. It can be seen that at both levels, the self-employed have a significantly greater extent of autonomy than employees ($p < 0.001$), which confirms that higher job autonomy is an occupational character of being the self-employed. Therefore, H2a is supported, that *when individuals' incomes are below the poverty line, the self-employed have higher job autonomy than employees*. As for the workplace wellbeing, the self-employed in poverty have not shown too much different with the self-employed with higher income (job satisfaction) ($p > 0.05$). However, within the employee's group, with higher income, the employees are experiencing a lower level of negative workplace wellbeing (job anxiety and job depression) ($p < 0.01$) rather than positive workplace wellbeing (job satisfaction) ($p > 0.05$).

For the intra-group comparison, roughly, when the self-employed and employees with higher income, the self-employed present a significantly higher job satisfaction and lower level of job anxiety and job depression ($p < 0.05$). Therefore, these results support H2b, H2c, and H2d: *when the incomes are below the poverty line, the self-employed have higher job autonomy and higher workplace wellbeing than employees*.

Table 9 Group Latent Means Differences among Job Autonomy and Workplace Wellbeing

	<u>Job Autonomy</u>				<u>Job Anxiety</u>				<u>Job Depression</u>				<u>Job satisfaction</u>			
	Δ Estimate	Std.err	Z-value	P(> z)	Δ Estimate	Std.err	Z-value	P(> z)	Δ Estimate	Std.err	Z-value	P(> z)	Δ Estimate	Std.err	Z-value	P(> z)
Within the self-employed groups																
Poverty VS Non-poverty (Group1 VS Group 3)	-0.024	0.024	1.029	0.304	0.044	0.033	1.356	0.175	0.025	0.026	0.966	0.334	-0.074	0.054	1.370	0.171
Within employees groups																
Poverty VS Non-poverty (Group1 VS Group 3)	-0.257	0.037	-6.997	0.000	0.181	0.035	5.239	0.000	0.048	0.032	1.501	0.003	-0.090	0.061	-1.469	0.143
The self-employed VS employees																
Poverty (Group1 VS Group 3)	-0.893	0.043	20.543	0.000	0.022	0.043	-0.524	0.000	0.120	0.037	3.254	0.001	-0.238	0.073	-3.250	0.001
Non-poverty (Group2 VS Group 4)	-0.605	0.019	31.853	0.000	0.110	0.022	4.923	0.000	0.142	0.018	7.940	0.000	-0.401	0.036	-11.236	0.000

Table 10 Correlation between Job Autonomy and Workplace Wellbeing

	Job Anxiety						Job Depression						Job Satisfaction					
	Whole dataset		Moderation: the		Moderation:		Whole dataset		Moderation: the		Moderation:		Whole dataset		Moderation: the		Moderation:	
			self-employed		employee				self-employed		employee				self-employed		employee	
	estimate	<i>p</i> -value	estimate	<i>p</i> -value	estimate	estimate	estimate	<i>p</i> -value	estimate	<i>p</i> -value	estimate	<i>p</i> -value	estimate	<i>p</i> -value	estimate	estimate	<i>p</i> -value	estimate
Age	-0.01	0.00	0.01	-0.06	0.00	0.01	-0.06	0.00	0.01	0.00	-0.01	0.00	0.01	0.00	0.01	0.01	0.01	0.00
Gender	0.03	0.09	-0.04	-0.03	0.13	0.08	-0.03	0.13	0.08	0.00	0.00	0.72	0.22	0.00	0.27	0.00	0.19	0.00
Marriage	-0.01	0.74	0.01	0.02	0.81	0.01	0.02	0.81	0.01	0.72	0.03	0.32	-0.01	0.08	-0.06	0.32	-0.06	0.16
Education	-0.04	0.00	0.01	-0.01	0.71	0.01	-0.01	0.71	0.01	0.02	-0.01	0.25	0.03	0.00	0.01	0.49	0.05	0.00
Job Autonomy	-0.15	0.00	-0.12	0.18	-0.00	0.31	-0.18	0.00	-0.31	0.00	-0.01	0.01	0.29	0.00	0.44	0.00	0.02	0.00
Poverty	0.04	0.00	0.04	0.05	0.00	0.02	0.04	0.00	0.02	0.35	0.08	0.01	-0.07	0.00	-0.10	0.06	-0.07	0.01
Autonomy*Poverty	-0.01	0.00	-0.02	0.18	-0.00	0.01	-0.02	0.00	-0.01	0.78	-0.01	0.00	-0.01	-0.00	-0.01	0.14	-0.02	0.00

2.5.2 SEM and Moderation effect test

Table 10 shows the model SEM pathway between Job Autonomy and Workplace wellbeing and moderation effect of poverty in whole data, the self-employed group and employee group. All the models goodness of fit shows good results (see in Table11). Generally, within the group of the self-employed and the group of employees, Job autonomy is significantly related to workplace wellbeing (job satisfaction, job anxiety and job depression) ($p < 0.001$), which confirm the *H1: In general, job autonomy has a positive or negative relationship with workplace wellbeing.*

In Table 8, for the self-employed, job autonomy manifests a strong predicting power on job-wellbeing. However, the poverty does not show a significant relationship with workplace wellbeing. Moreover, the interaction term job autonomy* poverty does not present its significance among the self-employed as well, which suggesting that poverty does not exert moderating effect between job autonomy and job anxiety. For the employees, and the whole dataset, job autonomy* poverty has significantly impact on relationship between job autonomy and job anxiety. Thus, the moderation effect of poverty is verified ($p < 0.01$).

Table 11 Summary of Goodness of Fit

Moderation model						
	χ^2	<i>df</i>	CFI	TLI	RMSEA	SRMR
Whole dataset	1183.985	103	0.98	0.973	0.038	0.034
The self-employed group	356.104	103	0.98	0.977	0.032	0.030
Employee group	1013.226	103	0.97	0.965	0.043	0.043

In conclusion, in the employee group, when the incomes of individuals are below the poverty line, job autonomy can weaker its magic powder on predicting workplace

wellbeing, and the moderating models support our third hypothesis *H3b: poverty moderates the relationship between job autonomy and workplace wellbeing in employee group*. However, this moderating effect cannot be found in the self-employed groups. Therefore, *H3a: poverty moderates the relationship between job autonomy and workplace wellbeing in the self-employed group* cannot be supported.

2.6 Discussion and Conclusions

Building on Maslow's hierarchy of needs and SDT, this study test the mean differences of job autonomy and workplace wellbeing between the self-employed and employees when they live in poverty. Consequently, the findings are concluded as below: Firstly, the self-employed are always experiencing higher job autonomy and workplace wellbeing than employees even their incomes are below the poverty line. Secondly, the pattern of job autonomy related with workplace wellbeing has been verified between the self-employed and employees. Thirdly, poverty exerts moderating effect in the relationship between job autonomy and workplace wellbeing only in employees group, that job autonomy's predicting power on workplace wellbeing is weaker in the employee observations with lower income. For the self-employed, the autonomy's power has no different no matter how much the self-employed earned. Our data size (n=20626) is large enough to provide sufficient empirical data evidence to answer our two main research questions.

This research makes contributions on theoretical, empirical and methodological aspects. On the theoretical perspective, Maslow's hierarchy of needs and SDT are classical theories, but to date a comprehensive empirical and theoretical development of two theories still is still far to adequacy in the entrepreneurship research, indicating that little can be said about the validity of the model within the field. By testing the interplay between Maslow's hierarchy and SDT, this study shed some light on both the

psychological and self-employment theories. This study focus on specific two factors in the context of working and their effects on workplace wellbeing: job autonomy from SDT theory and personal income from Maslow's hierarchy. It is found that income constrains job autonomy's magic power on workplace wellbeing in employee group rather than the self-employed's group. These findings respond the current research interest in the psychological field of studying the interplay between the theories of SDT and Maslow's hierarchy of needs (López-Rodríguez and Hidalgo, 2014; Tay and Diener 2011 and Chen, 2015).

Moreover, empirically, this study does not only confirm the results consistent with previous research which implies that the self-employed are happier than employees (Benz and Frey, 2004), which largely due to the extent of job autonomy that the self-employed owned (Le Blanc et al., 2001). It also pays attention to the income status. In this study, more than 30% the self-employed live in poverty, while the employee is 13%. Indeed, the self-employed have a greater chance to stay in poverty status. However, we found that, regarding the self-employed, poverty cannot constrain job autonomy's magic power on workplace wellbeing among the self-employed but can be found significantly among employees. This confirmed many entrepreneurial researchers' inference that non-monetary rewards of the self-employed can be a distinguished motivator of starting and maintaining their own business even to some extent exceeding the significance of financial reward (Merz 2007; Shane, 2008). This enlightens policymaker to emphasise more on workplace wellbeing as non-monetary rewards while promoting entrepreneurial activities.

In light of methodology, matching approach is applied in this study as an approach to update the sample. It is believed that by applying this approach, controlling for the demographic differences among groups before multiple-group analysis can be more

accurate for researchers dealing with group differences via CFA. This method reduces the complex multiple regression control process while measuring mean differences of latent variables (most multiple-group analysis papers does not have the process of controlling for demographic differences, but just constraining the measurement invariance, however, measurement invariance constraint cannot control for those group differences, especially those highly relate with the measured variable). Therefore, this study wishes this method can shed some light on the research approach for the further multi-group research.

The limitations of this study are similar to all the common studies, firstly, this study have relied on self-reported measures of workplace wellbeing derived from answers to subjective questions that may be perceived differently by people with different background and personality(Kristensen and Johansson2008; Le ´vy-Garboua and Montmarquette 2004). Many of the patterns this study uncovered were intricate and cannot be explained simply by broad response variables such as social desirability or acquiescence. The measures by self-reported used in the Understanding Society survey were undoubtedly less than optimal regarding reliability, owing to the need for brevity and simplicity in a large survey of this type conducted in the UK. With better measures, it is expected that the associations would have been stronger. Furthermore, the current analysis does not allow isolating directions of causality. Although the sample is a notable strength of our study, there are limitations as well to the methods used in the study. Because our sample is cross-sectional, it cannot be certain of causal direction. People with higher workplace wellbeing might be more likely, for example, to have a prosperous motivation to increase financial income and own the psychological capability of managing autonomy over the work. Thus, it is suspected that many of the associations this study uncovered have bidirectional causality. In the future, by taking

the advantage of experimental, quasi-experimental, and longitudinal approach, a strong case can be made that the needs this study involved do in fact cause increases in workplace wellbeing.

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Chapter 3 Do the self-employed experience lower work-related stress: A JDCS model test

3.1 Introduction

According to the World Health Organisation, impaired psychological wellbeing is one of the most prominent causes of reduced job involvement and absenteeism from the workplace (Harnois and Gabriel, 2000). The most common reason for this impaired psychological wellbeing is work stress, which occurs when job requirements exceed employee mental and physical resources such that they are perceived as threatening or even harmful (Lazarus and Folkman, 1984; World Health Organization, 2014). A high level of work-related stress can produce negative impacts at individual, organisational and even societal level. At the individual level, high stress from work can threaten one's mental and physical health, overall wellbeing and even is associated with disease incidence and reduced life expectancy (Gardner and Oswald, 2004). At the organisational level, work stress adversely affects efficiency, productivity and work-team performance. At the social level, stress consumes significant social resources and increases financial costs. It is estimated that €617 billion is spent annually for dealing with job depression (including stress) in Europe (EASHW, 2014). This figure comprises costs to employers, loss of productivity, health-care costs, and social welfare costs in the form of disability benefit payments. Therefore, understanding the production mechanisms, and coping strategies of work-related stress is crucial to individuals, organisations and policymakers.

The self-employed, as a particular occupation group, has always been associated with positive words such as economic growth, potential job creation and employment (Koellinger and Thurik, 2012; De Wit and De Kok, 2014), and has therefore attracted the attention of governments and academia. However, the start-up of a new venture is precarious: most entrepreneurial activities end in 'near-misses' (Renko, 2013). In other words, the majority of entrepreneurial activities die while

emerging. Reynolds (2007) found that during six years from entering the entrepreneurial process, about one-third left their self-employment activity. Workplace wellbeing is a prominent motivator for self-employment, thus understanding the causes and coping mechanisms of self-employed work-related stress will allow researchers and policymakers to develop suitable approaches to reducing the rate of self-employment exit, and enhancing their entrepreneurial development.

In the past, many studies have linked self-employment with positive emotional outcomes such as passion, excitement, happiness, flow, and satisfaction (Patzelt and Shepherd, 2011). With policy focus moving to work-related stress, the association between self-employment and work stress has been continually emphasised by academia (Shepherd and Patzelt, 2015; Baron et al., 2016). However, there are a limited number of studies in this area, and the question remains as to whether the self-employed experience higher or lower work-related stress. Initial studies found self-employment to be positively associated with work-related stress (Andersson, 2008; Blanchflower, 2004; Harris et al., 1999; Jamal, 2009). More recently, the opposite effect has been observed (Patzelt and Shepherd, 2011; Baron, Franklin and Hmieleski, 2016; Hessels, Rietveld and Zwan, 2017). However, studies on explore the factors contribute to the work-related stress are rare and call for the further research urgently (Hessels, Rietveld and Zwan, 2017).

To better understand the factors contribute to the work-related stress, this paper will use the Job-Demand-Control-Support model (JDCS) as the conceptual model. This is a popular model developed by Karasek (1989) and outlines the impact of specific job characteristics (job demand, job control, and social support) on work-related stress. JDCS is an extension of the Job-Demand-Control model (JDC), integrating social support into the model as a further fundamental characteristic

associated with work stress. JDC has been applied in Hessels, Rietveld and Zwan's (2017) paper to study self-employed work-related stress and considered the role of job demands and job control on work-related stress but excludes the social support. With the aim of expanding Hessels, Rietveld and Zwan's (2017)'s research, this study will take social support into account and test the JDCS model. The JDCS model contains two kinds of relationship between JDCS dimensions and work-related stress: 1) the additive effects of demands, control, and social support on reducing stress, and 2) interactive effects predicted by the buffer hypotheses of the JDCS model: which involves interaction among characteristics on stress. In previous literature applying the JDC/JDCS models, the additive effects are consistently found when sufficiently large samples are employed (Niedhammer, Chastang and David, 2008; Edimansyah et al., 2008; Ibrahim, and Ohtsuka, 2014). Concerning interactive effects, the empirical status of the interactive hypotheses is less conclusive: only weak empirical support for multiplicative effects has been obtained to date. For example, Van der Doef and Maes (1999) reported that out of 31 studies that examined the moderating effect of work characteristics on work-related wellbeing, only 5 partially supported the buffering hypothesis of the JDCS model. This issue was addressed in a critical theoretical article by Taris (2006). By interpreting the body of evidence presented by van der Doef and Maes (1999), Taris raised the question of whether the interactive hypothesis is a "zombie theory", as it should die due to lack of empirical evidence, but persists in theoretical debate and empirical research. In particular, there has been limited empirical studies examining the effects of social support (Riolli and Savicki, 2003; Thong and Yap, 2000) Therefore, this study aims to provide more empirical evidence to answer Taris' question, and test the moderating effects of social support on work-related stress.

In addition, this study predicts differences in work-related stress between two types of self-employment: solo self-employment and self-employment with hiring employees, as they may experience different levels of work-related stress. For example, the sets of tasks of the self-employed with hiring employees have to require a variety of skills and experiences (Lazear, 2005). Self-employed individuals with employees need to make supervisory decisions regarding how their employees should allocate their time and effort (Høbert and Link, 2009). Prior studies among wage-paid workers indicate that supervisors report more stress than those without a supervisory role (Groot and van den Brink, 1999). Hessels, Rietveld and Zwan (2017) based on the JDC model, found work-related stress to be higher for the self-employed with (rather than without) employees, due to their higher job demand.

Regarding research gaps discussed above, this study proposes to answer the following questions: 1) How does work-related stress differ among employees, the solo self-employed and the self-employed with hiring employees? 2) How do job demand, job control, and social support affect work-related stress among the three occupation groups? 3) What are the moderating effects of social support on the relationship between other factors and work-related stress? The dataset is sourced from Understanding Society, the largest UK household dataset, consisting of 13,917 observations (Employees: n=12,348; Solo self-employed: n=1,282; self-employed hiring employees: n=287). This study merges Waves 5 and 6 datasets to capture all required variables (University of Essex, 2016).

This study aims to contribute to the literature in three ways: 1) by comparing work-related stress between employees, solo self-employed and self-employed with hiring employees, this study strive to provide further empirical evidence to answer the question: Do the self-employed experience higher or

lower work-related stress? 2) This study will provide new empirical evidence to test the JDCS model, particularly in terms of the interaction effects of social support, which largely lacks empirical evidence, especially concerning the self-employed group. 3) This study will use a matching approach to update the dataset. By applying this method and controlling for the demographic differences among groups, this study can present a more accurate picture of group differences and can shed some light on the research approach for further comparative studies.

3.2 Theory and Hypotheses

3.2.1 Self-employment and stress

Boyd and Gumpert (1983) demonstrated that the majority of the self-employed encounter physical problems at least once a week (such as indigestion, insomnia, and headaches owing to stress), mainly because they feel that being accountable for their business and their employees are burdensome. These stress experiences are independent of whether the firm is performing well, suggesting that it is the overall daily tasks and challenges that the self-employed must manage, and the accompanying workload in particular, that increases the likelihood of experiencing stress (Boyd and Gumpert, 1983; Harris et al., 1999). Nonetheless, Boyd and Gumpert (1983) have not compared work-related stress between the self-employed and wage-paid workers. So far, empirical evidence comparing levels of stress between the self-employed and wage-paid workers is increasing but lack a consistent result, and scholars have recently called for further research into this topic (Shepherd and Patzelt, 2015; Baron et al., 2016). Table 1 summarises the prior studies that investigate differences in stress between the self-employed and wage-paid workers. Some of these studies find that the self-employed experience higher levels of work-related stress (Lewin-Epstein and Yuchtman-Yaar, 1991; Jamal, 1997;

Blanchflower, 2004; Jamal, 2009) or life stress (Cardon and Patel, 2015) than wage-paid workers. Other studies, however, do not find significant differences in perceived work-related stress (Andersson, 2008; Parslow et al., 2004) or perceived life stress (Parasuraman and Simmers, 2001; Prottas and Thompson, 2006) between self-employed individuals and wage-paid workers. Some studies provide mixed results, depending on the specific measurement used for stress (Buttner, 1992; Harris et al., 1999; Stephan and Roesler, 2010). In addition, some studies suggest that work-related stress levels may be lower for the self-employed than for wage-paid workers. Eden (1975), for example, finds that the self-employed experience significantly less role strain in their work than wage-paid workers. A recent study using a sample of business founders observes that perceived stress – although not specifically work-related – among business founders is significantly lower than perceived stress reported in another study among wage-paid workers (Baron et al., 2016). Moreover, Rahim (1996) finds that job stress is lower for the self-employed than for managers. The overview in Table 1 indicates that empirical studies of the relationship between self-employment and (work) stress provide contradictory findings. There are several reasons for this. Firstly, many different stress measures have been used in these studies. Buttner (1992), for example, measures stress according to health conditions that are thought to be related to stress (see also Stephan and Roesler, 2010). Some studies focus on work characteristics that could lead to stress, such as role ambiguity or role conflict (Eden, 1975; Rahim, 1996; Jamal, 1997; Harris et al., 1999), whereas others capture more directly whether jobs are perceived as stressful (Lewin-Epstein and Yuchtman-Yaar, 1991; Blanchflower, 2004; Andersson, 2008). Furthermore, some studies do not focus explicitly on work-related stress, but rather assess life stress (Parasuraman and Simmers, 2001; Prottas and Thompson, 2006; Baron et al., 2016). Secondly, some studies use measures other than self-employment to define occupational statuses, such as being a

business founder (Rahim, 1996; Baron et al., 2016), business-owner (Parasuraman and Simmers, 2001) or owner-manager (Buttner, 1992), and generally no distinction is made between different types of self-employment. Thirdly, Table 1 reveals that several studies employed very small samples and that several of the samples were collected from specific environments and time periods, which could also be a factor contributing to the mixed results. Finally, the studies are all cross-sectional, except one that uses data from two different years (Andersson, 2008). Moreover, it is noted that the methods used are relatively simple and at descriptive-level, with only a few studies employing multivariate regression analysis (Lewin-Epstein and Yuchtman-Yaar, 1991; Blanchflower, 2004; Parslow et al., 2004; Andersson, 2008). The use of descriptive methods could also explain the divergent outcomes of the studies, which do not control for any additional factors (other than employment status) that contribute to stress.

These mixed findings in the existing literature render it difficult to draw general conclusions about the relationship between self-employment and work-related stress. The literature on this topic is growing but remains limited, and theory does not drive the empirical analyses (of cross-sectional samples of relatively small size). In fact, none of the studies included in Table 1 attempt to theorise and empirically analyse the causes of potential stress differences between the self-employed and wage-paid workers, or between different groups within self-employment. Consequently, in consideration of no consistent result from prior studies on the difference between the self-employed and employees, Thus, it is assumed:

Hypothesis 1a: Self-employed (solo self-employed and self-employed with hiring employees) experience less work-related stress than individuals in wage work.

Hypothesis 1b: Self-employed (solo self-employed and self-employed with hiring employees) experience higher work-related stress than individuals in wage work.

As noted above, this study distinguishes self-employment into self-employed individuals with and without employees. The distinction between self-employed people running businesses that employ others (self-employed with employees) and those who work on their own (self-employed without employees) is often made in entrepreneurship research (e.g., Earle and Sakova, 2000; Blanchflower, 2004; Prottas and Thompson, 2006; Sorgner et al., 2014; Tamvada, 2010). Both subgroups have created jobs for themselves, but the self-employed with employees also provide jobs for others and are therefore of particular interest for the economists (Blanchflower, 2004). These different types of self-employed individuals may also experience dissimilar levels of work-related stress. The general absence of this distinction in earlier studies of stress and self-employment may explain the mixed findings in this stream of research (Shepherd and Patzelt, 2015). Hessels and his colleagues (2016) conducted research to find the differences of work-related stress between self-employed and employees, with the findings indicating that the self-employed with hiring employees experience higher stress than the solo self-employed, due to high job demands by using mean difference. Thus, this study aims to provide more empirical evidence to verify this result.

Hypothesis 2: self-employed with hiring employees experience higher stress than solo self-employed.

In the next paragraph, this study uses the JDCS model to understand the relationship between self-employment and work-related stress and to make predictions about relationships based on the JDCS model suggested.

3.2.2 JDCS model

In 1979, Robert Karasek introduced a seminal model that outlines the impact of adverse job characteristics on health and wellbeing the Job Demand-Control (JDC) model. Karasek (1979) identified job demands and job control as essential job characteristics influencing work-related stress. 'High stress' jobs are those with a combination of high job demand and low levels of job control. High-job demand with a high level of control would not be associated with stress because these are active jobs which allow the individual to develop proactive behaviours that can increase motivation to perform and learn (Karasek, 1979). 'Passive jobs' however, are characterised by low demand and low control and are considered to be dissatisfying. According to Fox et al. (1993, p. 290) 'when employees adapt to low-control and low-demand situations, they tend to find it difficult to make sound judgments and address the problems, and challenges that they may be confronted with.' The following years, social support was integrated into the model as a further fundamental characteristic of the work environment, which be used to reduce stress in working environment, after that, named the Job Demand-Control-(Support) (JDCS) model (Johnson and Hall, 1988; Johnson, Hall, and Theorell, 1989).

Thus The JDCS model has three components: job demands, job control, and social support (Karasek and Theorell, 1990). Job demands are originally defined as 'psychological stressors involved in accomplishing the workload' (Karasek and Theorell, 1990:291). Job control (originally decision latitude) is the extent to which an employee has authority to make decisions and utilise skills concerning the job, while social support is characterised by helpful relations with supervisors and coworkers. According to hypotheses suggested in the models, the JDC/JDCS model contains two

kinds of relationship between JDC/JDCS dimensions and job-related wellbeing: 1) the additive effect of demands, control, and social support on general psychological wellbeing and 2) the interactive effects predicted by the buffer hypotheses of the JDC/JDCS model: interaction between demands and controls which affect wellbeing, and the interactive effect of social support on the workplace as a third dimension.

With reviewing the previous literature by applying the JDCS model, the additive effects are consistently found when sufficiently large samples are employed. For example, reviewing of 20 years of empirical research using Karasek's model confirmed that high demand and low control work environments are associated with lower psychological wellbeing and job satisfaction, burnout and other forms of psychological distress (Van der Doef and Maes, 1999), and significantly impact on employee wellbeing (Noblet, 2003). An early study by Marshall, Barnett and Sayer (1997) involving 600 manufacturing and services industries in the United States found that job demands significantly affect workers' psychological distress.

Secondly, turning towards to the interactive effects, the empirical status of the interactive hypotheses is less conclusive: Only weak empirical support for multiplicative effects has been obtained to date. For example, Van der Doef and Maes (1999) report that out of 31 studies that examined the moderating effect of job control on the relationship between job demands and wellbeing, only 5 partially supported the buffering hypothesis of the JDC model. For instance, similar to Pelfrene et al. (2002) who did not find evidence for buffering effect of job control on the relationship between job demands and psychological distress, neither Pomaki and Anagnostopoulou (2003) nor Rasku and Kinnunen (2003) found buffering effect on teachers' wellness outcomes. Testing the buffer hypothesis of the JDC model, Niedhammer et al. (2008) also did not find evidence of the interaction between job demands and job

control on health outcomes in self-reported health, sickness absence and work injury among French workers. This issue was recently addressed in an important theoretical article by Taris (2006). Interpreting the body of evidence presented by van der Doef and Maes (1999), Taris raised the question whether the interactive hypothesis is a “zombie theory” that should have died from lack of empirical evidence but persists in theoretical debate and empirical research. Therefore, this study aims to provide more empirical evidence to answer the Taris’s question.

Job demand is typically operationalised in terms of quantitative aspects such as workload and time pressure (Karasek, 1989; van der Doef and Maes, 1999). However, role conflicts, as well as physical and emotional demands, are also frequently employed to measure job demands recently. (Gunnarsson, 2010). Within entrepreneurship, most research on the characteristics of the self-employed found that they report high job demands and a high workload (Stephan and Roesler, 2010). Working conditions in micro-enterprises often entail working long, irregular and arduous hours with a great deal of time pressure and heavy workloads (Lindstrom et al., 2000). These factors might have a negative influence on work-related stress.

Therefore, H2a: job demands are positively related to the self-employed’s work-related stress

The second job characteristic, **job control** (also termed decision latitude), refers to the extent to which a person is capable of controlling their tasks and general work activity. Self-employment and psychosocial working conditions in micro-enterprises often mean close relationships, flexibility and control: these factors can facilitate a balance between work and family responsibilities, reduce stress and promote good health. Several studies show that the self-employed have very high decision authority, control how work is organised and control how resources are distributed at their workplace,

as they often own their enterprise (Hundley, 2001; Stephan and Roesler, 2010). From the entrepreneur's perspective, on the aspect of job control, objectively, entrepreneurs have very high decision authority as they own their enterprise and control how work is organised and how resources (e.g., time, money, assets) are distributed at their workplace (Rau et al. 2008). Based on the finding that high job control is beneficial for employees' health and wellbeing (de Lange et al., 2003), Thus it is expected that entrepreneurs experience better health compared, when they report higher job control.

Hence, H3a: job controls are negatively related to the self-employed's work-related stress

As mentioned above, the JDC model was extended by integrating **social support** in the workplace as a third dimension. It has been suggested that social support at work, the positive or helpful social interaction available from management and co-workers, could be a significant factor in the ethology of stress for IS professionals (Thong and Yap, 2000). A sound support may appear to improve coping of work-related stress.(Johnson and Hall, 1988). Considerable researches have indicated that both work and non-work related social support reduces, or buffers the adverse impact of exposure to work-related job stress, it has been suggested that such support can also be counterproductive to psychological wellbeing (Dollard et al., 2000).

Therefore, H4a: social support is negatively related to the self-employed's work-related stress

According to the buffer hypothesis of the JDCS model, social support moderates the impacts of job demand and job control of work-related stress. However, a limited number of researches have conducted study on this moderating effect. Results addressing the moderating effect of social support were inconsistent (e.g., Chay, 1993; Rahim, 1996). Some researches support the moderating effects of

social support. For example, Chay (1993) found support for the moderating effect such that those individuals with high social support were little affected by decrements in job discretion, whereas the psychological wellbeing of those with low social support was affected by low job discretion. Moreover, both Riolli and Savicki (2003) and Thong and Yap (2000) have posited that social support can provide a moderating effect in the stress sequence for information system professionals. Rahim (1996), on the other hand, did not find support for the moderating effect of social support for either entrepreneurs or managers. Cohen and Wills (1985) suggested that one reason for this lack of consistency regarding the moderating effect of social support is that research has not necessarily matched the source of support with the domain of stress. However, to explore this issue with new evidence, this study address the perspective of JDCS model to assume

H5a: social support moderates the relationship between job demands and the self-employed's work-related stress

H6a: social support moderates the relationship between job controls and the self-employed's work-related stress

3.2.3 Employees vs the self-employed

To develop hypotheses about the relationship between self-employment and work-related stress, we investigate differences in job demand, job control and social support between the self-employed and wage-paid workers. Regarding job demand, the self-employed typically have longer working hours than wage-paid workers, which may contribute to job demand (Hyytinen and Ruuskanen, 2007). Hassels, Rietveld and Zwan (2016) argued that long hour working among the self-employed may not

have to result in higher stress level compared with employees, as they explained that ‘working longer hours may indicate the business is doing well and has, for example, been associated with higher levels of work satisfaction among the self-employed’ (Millán et al., 2013). Moreover, some aspects of self-employment like dependency on suppliers and customers, may contribute to job demand but with little indication in academia. However, Hassels, Rietveld and Zwan (2016) argued that some features of self-employment may decrease job demand, for example, self-employed face fewer demands associated with the routines and hierarchical constraints of organisations than wage-paid workers (Eden, 1975). These differences may contribute to higher or lower work-related stress of the self-employed compared with wage-paid workers. Consequently, the relationship between job demands and work-related stress may also vary between these two occupational groups.

Thus, based on *H2a: job demands are positively related to the self-employed’s work-related stress*, we propose:

H2b: the self-employed (baseline is employees) moderate the relationship between job demand and work-related stress

Secondly, as verified by many previous studies, the majority of self-employed have significantly higher levels of job control than wage-paid workers (Eden, 1975; Benz and Frey, 2008; Hamilton, 2000; Hundley, 2001; Parasuraman and Simmers, 2001). The self-employed have more freedom to make decisions about what to do at work and how and when to perform their tasks, whereas wage-paid workers operate within organisational hierarchies in which they are subject to the decisions of others (Benz and Frey, 2008). In other words, on average, the self-employed have more decision-making authority than wage-paid workers. More decision-making authority is evident, for example, in having

more frequent intervals between spells of work and in being able to do work outside the workplace (Hyytinen and Ruuskanen, 2007). The self-employed are in control of their businesses and hence can redefine activities when new tasks emerge and to implement changes (such as the introduction of new working procedures or modification of the product portfolio) when they desire (Hundley, 2001). A higher degree of decision authority enables a greater ability to reduce stress and work-related stress (Patzelt and Shepherd, 2011).

Thus, based on *H3a: job controls are negatively related to the self-employed's work-related stress*, we propose:

H3b: the self-employed (baseline is employees) moderate the relationship between job control and work-related stress

Another difference between the self-employed and employees is that the self-employed would be expected to have differences in social support, especially the supports from family and friend, compared with managers or employees. One significant aspect is the family, friend and partner support on self-employment by furnishing labour and enabling the pooling of financial resources (Sanders and Nee, 1996). For example, concerning financial aspects, social support can reduce living costs and promote accumulation of financial capital and achieve intra-family/intra-friend loans (Sanders and Nee, 1996). Moreover, a reliance on family or friends' labour can help the self-employed with management demands (Tetrick et al., 2000). Furthermore, such labour can provide emotional support when the self-employed experience business difficulties and they can be trusted to handle sensitive transactions in which the risk of opportunism and malfeasance is high (Sanders and Nee, 1996). On the other hand, for employees, social support, especially from family, partner and friends, may be limited

due to company policy and organisation hierarchy constraints.

Thus, based on *H4a: social support is negatively related to the self-employed's work-related stress*

This study proposes:

H4b: the self-employed (baseline is employees) moderate the relationship between social support and work-related stress

Moreover, to develop buffer hypotheses on the moderating effect of social support, this study considers the differences of moderating effect of social support between the self-employed and employees. Firstly, it is needed to understand that the rationale underlying this moderating effect is that social support facilitates one's efforts in coping with stress and, as such, can be considered a coping resource – those more efficient in garnering social support may appear to improve coping (Johnson and Hall, 1988). As noted before, it is not only easier for the self-employed to gain the social supports in term of quantity but also in term of quality, social support may works more efficiently directly and indirectly, while wage-paid workers are constrained due to the complexity of their served organisations.

Thus, based on:

H5a: social support moderates the relationship between job demands and the self-employed's work-related stress

H6a: social support moderates the relationship between job controls and the self-employed's work-related stress

If the results of H5a and H5b are different, this study propose:

*H5b: the self-employed (baseline is employees) moderate the relationship between the interaction of social support*job demands and work-related stress*

*H6b: the self-employed (baseline is employees) moderate the relationship between the interaction of social support*job control and work-related stress*

3.2.4 Self-employed with hiring employees vs the solo self-employed

On average, the jobs of the self-employed with employees are associated with higher levels of job demand than the jobs of the self-employed without employees. The self-employed with employees are more likely to report working under high pressure than those without employees (Blanchflower, 2004). Running a business employing others is also accompanied by a higher workload. Additional tasks related to running more complex ventures have to be performed, such as attracting and securing financing and recruiting and supervising employees (Hébert and Link, 1989; Lazear, 2005). Moreover, one must ensure that there is sufficient work for every employee to be able to pay salaries, the self-employed with employees must cope with multiple demands and diverging expectations as well (Cowling et al., 2004). On the other hand, the self-employed without hiring employees are less constrained by the need of coordinating with others (such as (co-)workers). Those solo self-employed individuals are also not pressured by demands stemming from organisational work routines and bureaucracy.

Concerning job control, the self-employed with employees have more freedom to choose the specific work tasks on which they wish to focus because they can delegate work to others. However, the

delegation also implies a loss of control as tasks are left to others. The relatively high level of job demand among the self-employed with employees makes us expect that they experience more work-related stress than the self-employed without employees (Hessels, Rietveld and Zwan, 2017).

The social support may also differ between the self-employed and the employees. Regarding social support, it differs compared to the solo employed, if the latter has recruited family or friends as employees, as they may receive better support in the workplace for managing and financial aspects. Also, the moderating effect of social support varies between the self-employed with hiring employees and the solo self-employed. However, there is no indication in the literature that the level of social support is different between the self-employed with and without employees (Sanders and Nee, 1996).

Thus, based on:

H2a: job demands are positively related to the self-employed's work-related stress

H3a: job controls are negatively related to the self-employed's work-related stress

H4a: social support is negatively related to the self-employed's work-related stress

H5a: social support moderates the relationship between job demands and the self-employed's work-related stress

H6a: social support moderates the relationship between job controls and the self-employed's work-related stress

This study proposes:

H2c: the self-employed with hiring employees (baseline is the solo self-employed) moderate the relationship between job demand and work-related stress

H3c: the self-employed with hiring employees (baseline is the solo self-employed) moderate the relationship between job control and work-related stress

H4c: the self-employed with hiring employees (baseline is the solo self-employed) moderate the relationship between social support and work-related stress

*H5c: the self-employed with hiring employees (baseline is the solo self-employed) moderate the relationship between the interaction of social support*job demands and work-related stress*

*H6c: the self-employed with hiring employees (baseline is the solo self-employed) moderate the relationship between the interaction of social support*job control and work-related stress*

3.3 Data, Methods and Measurements

3.3.1 Dataset

This study selected observations from those claiming themselves as being self-employed or employees and participating in the survey of both Waves 5 and 6 from Understanding Society. The used dataset consisted of 3,743 observations (employees: n=1,972; solo self-employed: n=1,423; self-employed hiring employees: n=348). This study merged Waves 5 and 6 datasets to capture all required variables (University of Essex, 2016).

3.3.2 Measurements

Work-related stress, the dependent variable, understanding society dataset automatically calculates two indexes to measure the two aspects of work-related stress: job anxiety and job depression, which is measured by using the job-related wellbeing scale developed by Warr (1990). This scale consists of two three-item subscales measuring ‘job-related depression’ and ‘job-related anxiety’. Both scales use a Likert-type response format and have demonstrated acceptable reliability and validity – with a higher score; observers experience a greater degree of job stress. Also Kerr, McHugh, and McCrory (2009), Rothmann (2008) used this measurement to test job stress.

Job Demand is measured by the amount of working hours per week, which is a popular variable applied in many studies (Nordenmark, Vinberg and Strandh, 2012).

Job control, the independent variable, Job Autonomy is measured by a five-item scale developed for Workplace Employment Relations Survey (WERS, 2004) to test the employees’ control power on the five aspects of their jobs: How the work is done; The order in which tasks are carried out; The pace of work; The tasks done in the job; Start and finish times.

Social support, is measured from three dimensions: a) support from the partner, b) support from family and c) support from friends. The items to capture each dimension are from three questions: ‘partner/family/friend understands the way I feel.’; ‘Can rely on partner/family/friend.’; ‘Can talk about worries with partner/family/friend.’ Answers range from 1 (a lot) to 4 (not at all). Here, we use principal component analysis to concentrate three dimensions’ subscale into three principle variables: partner support, family support and friend support, and merged them into a single variable termed

social support. These questions are limited and are available only from the social support module of the fifth wave understanding society dataset.

The self-employed (SE) is measured as 1 (self-employed) and 0 (employees).

The Self-employed with Hiring employees (SEE) is measured as 1 (self-employed with hiring employees) and 0 (solo self-employed).

Demographic variables include age, sex, marital status and education and monthly job-related income, which has been demonstrated by previous literature to be significantly related to work-related stress. For instance, women tend to report more work-place psychosomatic symptoms which may present as higher stress level than men do (Jamal and Badawi 1995). Similarly, Jamal (1997) noted that age might play a major role in work-related stress: older people report less work-related stress than younger people do, as they are more experienced on handling work tasks. Moreover, higher education may enlarge individual's employment opportunity and hence enhance the chance to find a more stratified job and a better knowledge of coping with stress. The single person experiences higher work-related stress due to the lack of family support (Zimmerman, 2005). Moreover, higher income is closely related to job wellbeing, which may affect work-related stress (Zimmerman, 2005). All these variables will be controlled in the matching approach to establishing a comparable dataset, which will be explained in the next part.

3.3.3 Methods

Regarding methodology, the paper will divide the research into three steps:

Firstly, establishing a balance sample by using a matching approach. Then, classifying them into three groups by observer's job identification. Secondly, investigate the mean differences in work-related stress, job demands, job control and social support among these three occupational groups after matching. This aims to test the following hypotheses:

Hypothesis 1a: *Self-employed (solo self-employed and self-employed with hiring employees) experience less work-related stress than individuals in wage work*

Hypothesis 1b: *Self-employed (solo self-employed and self-employed with hiring employees) experience higher work-related stress than individuals in wage work*

Finally, to test Hypotheses 2 to 6, this study will employ the hierarchy models to test the direct and moderating effects in the regression. The direct model is conducted to test the effects of job demand, job control and social support on work-related stress among the self-employed. Then, the interaction terms of job demand and social support (job demand *social support) and an interaction term of job control and social support (job control *social support) will be added into the model to test the moderating effect of social support on the relationship between job characteristics and work-related stress.

The moderating hierarchy regression models were run among different groups, which aim to investigate the differences of social support's moderating effect between the self-employed and employees and between the self-employed with hiring employees and the solo self-employed.

3.3.4 The matching approach and matched dataset

This paper uses propensity score matching (Nonparametric Preprocessing for Parametric Causal Inference), which is a statistical technique in which a treatment case is matched with one or more control cases, based on each instance's propensity score, in order to ensure two groups are matched (see Figures 4 and 5). This paper will use R software to run the matching approach, by applying the software package 'Matchit'. To be more specific, we control the rationale of the treatment group population to control group population group as 1:1, i.e. 1,423 (solo self-employed): 1,423 (employees) and 348 (self-employed with hiring employees): 348 (employees). Before being matched, it is observed that the self-employed are more often male, older, with better mental health and less educated than wage-paid workers, whereas for education, contradictory evidence has been found in the earlier literature (Van der Sluis et al., 2008). The self-employed without employees have lower incomes than wage-paid workers, whereas the self-employed with employees have higher incomes than the salary workers (corresponding to earlier studies such as Sorgner et al., 2014). All these variables are closely associated with work-related stress. After being matched, it can be seen that the demographical differences among control variables are largely reduced; the T-test p-values results (Table 12) show no significant differences in demographic variables between the solo self-employed and employees and between the SEE group and employees. The difference of variable distance between the two groups is largely reduced after matching as well (the SEE vs Employees: before matching: 0.07, after matching: 0; the Solo SE vs Employees: before matching: 0.19, after matching: 0.13). Also, the distribution of propensity scores tends to be similar between the two groups after matching.

Figure 4 Distribution of Propensity Scores: Solo Self-employed VS Employees

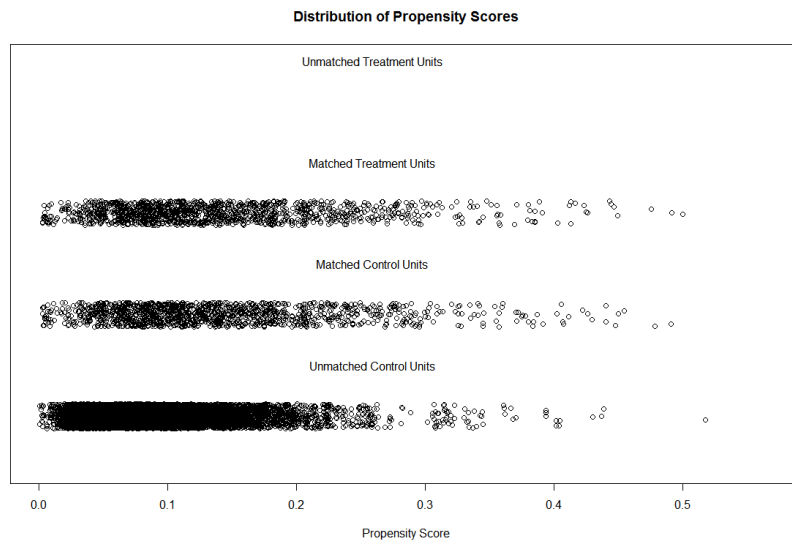


Figure 5 Distribution of Propensity Scores: Self-employed with Hiring employees VS Employees

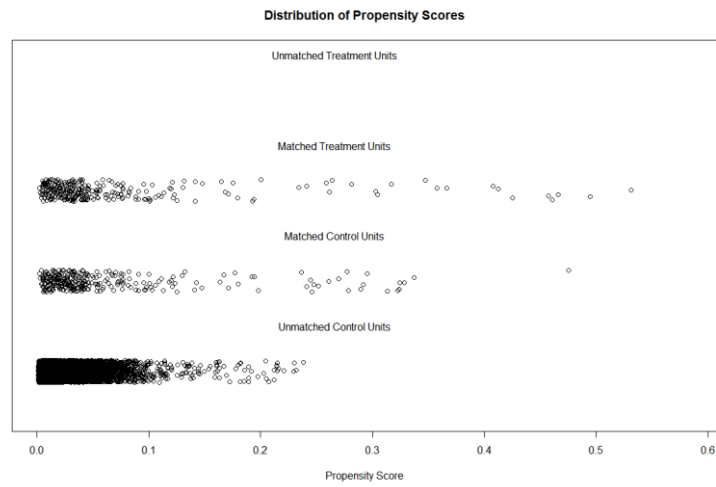


Table 12 Mean, Mean Differences, T-test of Control Variables Before and After Matching

	Sole SE VS Employees							Solo SE VS Employees						
	SEE N=348			Employees N=1972				Solo SE N=1423			Employees N=1972			
	Before matched			After matched				Before matched			After matched			
	mean	mean	T-test	Mean differences	mean	T-test	Mean differences	mean	mean	T-test	Mean differences	Mean	T-test	Mean differences
Control Variables														
Distance	0.21	0.14			0.21			0.53	0.34			0.40		
Age	50.07	44.82	0	5.25	50.34	0.76	-0.27	49.78	44.82	0	4.96	48.84.98	0.42	0.94
Sex	0.31	0.53	0	-0.22	0.30	0.87	0.01	0.40	0.53	0	-0.13	0.44	0.72	-0.04
Single	0.00	0.01	0	-0.01	0.00	0.99	0	0.01	0.01	0	0	0.02	0.76	-0.01
Education	2.9	2.6	0.01	0.3	2.77	0.58	0.13	2.86	2.6	0	0.26	2.81	0.24	0.05
Physical Health	52.75	53.09	0.42	-0.34	53.01	0.81	-0.26	52.13	53.09	0	-0.96	52.90	0.19	-0.77
Mental Health	51.57	50.66	0.04	0.91	51.53	0.90	0.04	52.37	50.66	0	1.71	51.86	0.05	0.51
Job Income	3999.26	2327.73	0	1671.53	3653.8	0.78	345.46	1916.41	2327.73	0	-411.32	1934.52	0.04	18.11

SE stands for the Self-employed
 Solo SE stands for Solo Self-employment
 SEE stands for Self-employed with hiring employees

Table 13 Mean, Mean Differences, T-test of Variables: Solo SE VS SEE

	<u>SEE</u>	<u>Solo SE</u>		
	mean	mean	mean differences	T-test
<hr/>				
Work-related stress				
Job Anxiety	3.11	2.22	-0.89	0
Job Depression	1.28	0.92	-0.36	0.03
Job Demands	42.59	32.33	10.26	0
Job Control	6.26	6.63	0.37	0
Social support	16.38	16.08	0.30	0.8
Control Variables				
Age	50.07	49.78	0.29	0.65
Sex	0.31	0.40	-0.09	0.04
Single	0.00	0.01	-0.01	0.02
Education	2.9	2.86	0.04	0.71
Physical Health	52.75	52.13	0.62	0.17
Mental Health	51.57	52.37	-0.8	0.08
Job Income	3999.26	1916.41	2082.85	0

Solo SE stands for Solo Self-employment

SEE stands for Self-employed with hiring employees

Table 14 Mean, Mean Differences, T-test of Independent and Dependent Variables Before and After Matching

	<u>Self-employed with hiring employees VS Employees</u>							<u>Sole Self-employed VS Employees</u>						
	SEE SE	Employees						Solo SE	Employees					
		Before matched			After matched				Before matched			After matched		
	mean	mean	T-test	Mean differences	mean	T-test	Mean differences	mean	mean	T-test	Mean differences	mean	T-test	Mean differences
Work-related stress														
Job Anxiety	3.11	2.93	0.47	0.18	2.45	0.04	-0.26	2.22	2.93	0	0.71	2.63	0	0.41
Job Depression	1.28	1.52	0.35	0.24	1.13	0.04	-0.27	0.92	1.52	0	0.6	1, 35	0	0.43
Job Demand	42.59	31.19	0	11.4	32.42	0	10.17	32.33	31.19	0.04	1.14	30.66	0.01	1.67
Job Control	9.26	9.37	0.11	-3.11	9.36	0.1	-3.1	9.63	9.37	0.16	-2.74	9.17	0	-0.46
Social Support	16.38	16.15	0.46	0.17	16.69	0.71	-0.31	16.08	16.35	0.66	-0.17	21.87	0.79	-5.79

Solo SE stands for Sole Self-employment

SEE stands for Self-employed with hiring employees

Table 15 Means, Standard Deviations, and Bivariate Correlations (After matched)

(n=3743)

	Mean	SD	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Job Anxiety	2.67	2.45													
Job Depression	1.27	2.07	0.02												
Job Demand	32.69	15.65	-0.04*	-0.08***											
Job Control	8.04	3.63	0.04*	0.16***	0.08***										
Social support	16.14	2.32	0.02	0.29***	0.27***	0.01									
Age	47.19	11.52	-0.05**	-0.08***	0.05**	-0.08***	-0.02								
Sex	0.46	0.5	0.01	0.11***	-0.01	-0.17***	0.03	-0.08***							
Single	0.02	0.11	0	0.04*	-0.14***	-0.35***	-0.07***	0.07***	-0.03						
Education	2.73	1.82	-0.04*	0.02	-0.02	-0.02	0.05**	-0.01	-0.04**	0.04*					
Physical Health	52.69	7.99	-0.04*	-0.09***	-0.01	0.02	0.02	0.04*	0.14***	-0.06***	-0.01				
Mental Health	51.40	8.13	0.03*	-0.05**	-0.01	0.06***	-0.05**	0.01	-0.18***	0.01	0.03	-0.15***			
Log(Job Income)	2326.76	2483.29	-0.01	0.45***	-0.12***	0.02	0.13***	-0.09***	0.13***	-0.10***	-0.12***	0.07***	-0.17***		
SE	0.47	0.5	-0.01	-0.10***	0.03	0.27***	-0.04*	0.02	-0.04**	-0.21***	-0.04*	-0.09***	0.13***	0.03	
SEE	0.10	0.29	0.06**	0.06***	0.03*	-0.10***	0.03*	-0.45***	0.11***	-0.04**	-0.01	0.02	-0.04*	0.03	-0.19***

*** p<.001; ** p<.01; * p<.05

SEE stands for Self-employed with hiring employees

SE stands for Self-employment

3.4 Results

Descriptive statistics – means and standard deviations and bivariate correlations – are presented in Table 15 for the whole dataset (N= 3,743). Results for Hypothesis 1a and Hypothesis 1b are displayed in Table 14. The direct and interaction effect results on Job Anxiety and Job Depression, which pertain to Hypotheses 2 to 6, are presented in Tables 16 and 17 separately.

Multicollinearity was checked, with results showing that the largest variance inflation factor was 1.3, below the value of 10 that is commonly viewed as problematic (Neter et al., 1996). Thus, multicollinearity is not a major threat to the integrity of the results.

Hypothesis 1a proposes that *the self-employed (solo self-employed and self-employed with hiring employees) experience less work-related stress than individuals in wage work*. Hypothesis 1b proposes that *the self-employed (solo self-employed and self-employed with hiring employees) experience higher work-related stress than individuals in wage work*. This study applies the t-test on two different work-related stresses: job anxiety and job depression in two different comparing groups (the SEE vs Employees, and the Solo SE vs Employees) based on before- and after-matching samples. As shown in Table 14, for the SEE vs Employees, before matching the significance of difference is not strong on job anxiety and job depression ($p>0.05$), but after matching, the significance of differences of job depression presented is stronger, with the SEE having significantly higher level of job depression ($p<0.05$). For the Solo SE vs Employees, based on before- and after-matching samples, the Solo SE has significantly lower levels of work-related stress (both with respect to job anxiety and job depression) ($p<0.01$). Thus, hypothesis 1a is supported in the Solo SE vs Employees group, not supported in the SEE vs Employees comparing group. Hypothesis 1b is tenable in the SEE vs Employees comparing group rather than the Solo SE vs Employees group.

Regarding the following hypotheses:

Hypothesis 2a: *job demand is negatively related to the self-employed's work-related stress*

Hypothesis 2b: *the self-employed (baseline is employees) moderate the relationship between job demand and work-related stress*

Hypothesis 2c: *the self-employed with hiring employees (baseline is the solo self-employed) moderate the relationship between job demand and work-related stress,*

The results are shown in Table 16 and Table 17. The results indicate that job demands are closely associated with job anxiety ($p < 0.05$) and job depression ($p < 0.01$) among all groups. Hence, Hypothesis 2a is supported. For both job depression and job anxiety, the interaction term job demand*SE is positively significant, which means the relationship between job demand and work-related stress is stronger in the self-employee group ($p < 0.01$) Hence, Hypothesis 2b is supported as well. Moreover, the job demand was significant in both SEE and solos SE group ($p < 0.01$), and the significance level is the same. Thus Hypothesis 2c is not supported.

The results of testing the following hypotheses:

Hypothesis 3a: *job controls are negatively related to the self-employed's work-related stress*

Hypothesis 3b: *the self-employed (baseline is employees) moderate the relationship between job control and work-related stress*

Hypothesis 3c: *the self-employed with hiring employees (baseline is the solo self-employed) moderate the relationship between job control and work-related stress,*

Firstly, job control exerted a significant impact on job anxiety ($p < 0.05$) and job depression ($p < 0.05$) within both SEE and solo SE groups, thus Hypothesis 3a is tenable. Job Control*SE was not significant in the whole dataset. Thus, the results does not offer support for Hypothesis 3b. Finally, the differences of the significance of job control between SEE and solo SE was not showed in regressions both on job depression (SEE: $p < 0.05$, SE: $p < 0.05$) and on job anxiety (SEE $p < 0.05$; SE: $p < 0.05$). Thus, the results do not support the moderation effect of SEE on the relationship between job control and job depression, and Hypothesis 3c is only partly supported.

In light of:

Hypothesis 4a: *social support is negatively related to the self-employed's work-related stress*

Hypothesis 4b: *the self-employed (baseline is employees) moderate the relationship between social support and work-related stress, and*

Hypothesis 4c: *the self-employed with hiring employees (baseline is the solo self-employed) moderate the relationship between social support and work-related stress,*

The results displayed that the social support did not have significant impacts on both job anxiety ($p > 0.05$) and job depression ($p > 0.05$) among the SEE, but has significant impact within solo SE groups on job depression ($p < 0.01$). Thus, the results partly support Hypothesis 4a. Also, the results showed that the relationship between social support and work-related stress is more significant in the self-employed group (social support* the self-employed: $p < 0.05$). Thus, Hypothesis 4b has supportive evidence. As the significances of social support are different between the SEE and the solo SE groups, Thus, Hypothesis 4c is supported.

With respect to the hypothesis proposing the moderating effect of social support and the differences of this moderating effect between the two different comparing groups (The SEE vs Employees, and the Solo SE vs Employees) the results are presented to test the following hypotheses:

H5a: *social support moderates the relationship between job demands and the self-employed's work-related stress*

H5b: *the self-employed (baseline is employees) moderate the relationship between the interaction of social support*job demands and work-related stress, and*

H5c: *the self-employed with hiring employees (baseline is the solo self-employed) moderate the relationship between the interaction of social support*job demands and work-related stress,*

The interaction term social support*job demands are only significant in the model of the regression on job depression ($p < 0.05$) among the self-employed rather than the employees. Moreover, the interaction term social support*job demands are more significant ($p < 0.05$) in a regression on job depression in the solo self-employed group when compared with SEE group. Therefore, H5b and H5c were also partly supported. The moderating effect on job demand and job depression was stronger in the self-employed

group when it was compared with employees, and it was also stronger in the Solo self-employed group when it was compared with the solo self-employed.

The last sets of hypotheses are:

H6a: *social support moderates the relationship between job controls and the self-employed's work-related stress*

H6b: *the self-employed (baseline is employees) moderate the relationship between the interaction of social support*job control and work-related stress, and*

H6c: *the self-employed with hiring employees (baseline is the solo self-employed) moderate the relationship between the interaction of social support*job control and work-related stress.*

From Tables 16 and 17, the results indicate that social support did not significantly moderate the relationship between job control and work-related stress (regression on job anxiety: $p > .05$); regression on job depression: $p > 0.05$). Moreover, this moderating term did not the present significance of variety between the self-employed and employees. Moreover, the interaction term social support*job control is not significant among the SEE and solo self-employed in the model of regression on both job anxiety and job depression ($p > 0.05$). Therefore, results do not provide support for H6c.

Table 16 Hierarchy regressions on Job Anxiety

	Whole			Employees			Solo SE			SEE		
	M1	M2	M3	M4	M5	M6	M7	M8	M9			
Age	0.00	0.00	0.00	-0.01	-0.01	-0.01	-0.01	0.00	0.00			
Sex	0.27 ***	0.28 ***	0.29 ***	0.17	0.18	-0.27	-0.26	0.23	0.13			
Single	-0.04	-0.04	-0.04	-0.05	-0.03	-0.04	-0.02	-0.71	-0.71			
Education	0.12 ***	0.12 ***	0.12 ***	0.11 **	0.11 **	0.08 *	0.08 *	0.22 *	0.23 *			
Physical Health	-0.02 ***	-0.02 ***	-0.02 ***	-0.02 **	-0.02 **	-0.01	-0.01	-0.02	-0.02			
Mental Health	-0.11 ***	-0.11 ***	-0.11 ***	-0.12 ***	-0.12 ***	-0.09 ***	-0.09 ***	-0.16 ***	-0.16 ***			
log(Job Income)	-0.22 ***	-0.22 ***	-0.22 ***	-0.13 **	-0.13 **	-0.06	-0.06	-0.07	-0.07			
Self-employed	-0.44 ***	-0.44 ***	-0.44 ***									
Job Demand	0.02 ***	0.02 ***	0.02 ***	0.01 **	0.01 **	0.02 ***	0.02 ***	0.03 ***	0.03 ***			
Job Control	-0.03 ***	-0.03 ***	-0.03 ***	-0.05 **	-0.05 **	-0.04 *	-0.04 *	-0.11 *	-0.13 *			
Social Support	-0.01	-0.01	-0.01	-0.03	-0.03	-0.09 **	-0.10 **	-0.09	-0.10			
Job Demand* SE			-0.01 *									
Job Control*SE			0.03									
Social Support*SE			0.01 *									
JD*Social Support		-0.00			-0.00		-0.04 **		-0.06 *			
JC*Social Support		0.00			0.00		0.02		0.01			
R2	0.16	0.16	0.17	0.19	0.20	0.13	0.14	0.26	0.28			
F	204.4	140.40	126.70	30.28	21.22	13.97	10.40	7.40	5.53			
P-Value	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			

*** p<.001; ** p<.01; * p<.05

Table 17 Hierarchy regressions on Job Depression

	Whole (Before Matched)			Employees(After Matched)				Solo Self-employed		SEE	
	M10	M11	M12	M13	M14	M15	M16	M17	M18		
Age	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	
Sex	0.21 ***	0.21 ***	0.21 ***	0.08	0.09	0.20 *	0.18 *	0.26	0.30		
Single	-0.02	-0.02	-0.02	-0.05	-0.01	-0.21	-0.18	-0.28	-0.30		
Education	0.08 ***	0.09 ***	0.09 ***	0.07 *	0.07 *	0.02	0.02	0.15 *	0.15 *		
Physical Health	-0.02 ***	-0.02 ***	-0.02 ***	-0.02 ***	-0.02 ***	-0.02 **	-0.02 **	-0.01	-0.01		
Mental Health	-0.12 ***	-0.12 ***	-0.12 ***	-0.11 ***	-0.11 ***	-0.09 ***	-0.09 ***	-0.17 ***	-0.17 ***		
log(Job Income)	-0.18 ***	-0.18 ***	-0.18 ***	-0.10 **	-0.11 **	-0.04	-0.04	-0.03	-0.03		
The self-employed	-0.47 ***	-0.47 ***	-0.47 ***								
Job Demand	0.02 ***	0.01 ***	0.01 ***	0.01 ***	0.01 ***	0.01 ***	0.01 ***	0.02 **	0.02 **		
Job Control	-0.04 ***	-0.04 ***	-0.04 ***	-0.04 **	-0.03 **	-0.03 *	-0.04 *	-0.01 *	-0.01 *		
Social Support	-0.03	-0.03	-0.03	-0.02	-0.02	-0.04 *	-0.04 *	-0.03	-0.03		
Job Demand*SE			-0.01 *								
Job Control*SE			0.01								
Social Support*SE			0.01								
JD*Social Support		-0.00 *				-0.00	-0.00		-0.00		
JC*Social Support		0.00				0.00	0.01		0.03		
R2	0.23	0.24	0.25	0.22	0.23	0.17	0.18	0.36	0.37		
F	312.30	214.50	176.40	36.27	25.71	20.49	14.71	11.79	8.20		
P-Value	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		

*** p<.001; ** p<.01; * p<.05

Par stands for Partner supports; Fri stands for Friend supports; Fam stands for Family supports; JD stands for Job Demand; JC stands for Job Control

3.5 Conclusion and Discussion

Who experience higher level of work-related stress? The self-employed or employees? The results from previous studies (Andersson, 2008; Blanchflower, 2004; Harris et al., 1999; Jamal, 2009; Patzelt and Shepherd, 2011; Baron, Franklin and Hmieleski, 2016; Hessels, Rietveld and Zwan, 2017) do not enable consistent conclusions. Hessels, Rietveld and Zwan (2017) suggested that this variety was due to the different stress measurements, methods and samples applied in the research. By involving the matching approach, dividing the self-employed group into the SEE and the Solo SE, and applying two kinds of work-related stress: job anxiety and job depression, Results of the present research indicate that different samples, methods and measurements can result in different conclusions. Before matching, the work-related stress did not present differences between the SEE and employees. Dramatically, after matching, the SEE had a significantly higher level of job depression and job anxiety than employees. This finding is consistent with previous research noting that the self-employed experience higher stress levels (Patzelt and Shepherd, 2011; Baron, Franklin and Hmieleski, 2013; Hessels, Rietveld and Zwan, 2017), and at the same time, it contract to other results which suggested that the self-employed are expected to experience lower or the same stress levels (Patzelt and Shepherd, 2011; Baron, Franklin and Hmieleski, 2016; Hessels, Rietveld and Zwan, 2017)). However, this study also found that the solo self-employed experience significantly lower work-related stress levels based on both before- and after-matching samples. This is contract to previous findings that the

self-employed experience lower stress levels (Patzelt and Shepherd, 2011; Baron, Franklin and Hmieleski, 2016; Hessels, Rietveld and Zwan, 2017).

The present research also sheds light on factors that contribute to the self-employed's work-related stress. Based on the three factors – job demand, job control and social support, from the JDCS model – this is found that job demand, job control have a direct predicting impact on the self-employed's job anxiety and job depression, which is in agreement with previous research (Hessels, Rietveld and Zwan, 2017). Moreover, the R square value increased by 0.4, while normally 0.2 is seen as significantly contributing to the model fit (Vaughn, 2008). Social support has direct impact on work-related stress only within solo SE group. Moreover, it has a moderating effect on the relationship between job demand and job depression in this group, with results partially supporting the interaction relationship in the JDCS model. Indeed, both van der Doef and Maes (1999) and this study found unsatisfactory evidence for the interactive hypotheses of the JDCS model. Even though the moderating term only contributed to the model fit by an increase of 0.1, since interaction patterns are running counter to the buffer hypotheses observed in the studies included in our analyses, we do not believe the buffer hypothesis to be a 'zombie theory'. Moreover, this is believed that far more support for the buffer hypothesis will be obtained in the future once the matching principle has been fully realised in empirical tests of the JDCS model.

Our findings also offer new evidence on differences in direct and indirect impacts of work-related stress factors between the self-employed and employees, and between

SEE and solo self-employed groups. For direct impacts, job control and job demand does not differ between the self-employed and employees, or between SEE and solo SE groups. In the comparison group of SEE vs Solo SE, social support has a stronger connection with work-related stress within the solo SE group. On the other hand, it is interesting to see that the relationship between the interaction term of job demand* social support and job depression is stronger among the self-employed when compared with employee groups. More specifically, within the self-employed, the interaction term of job demand* social support has a stronger impact within the solo self-employed in terms of job anxiety. On the other hand, job control*social support does not show any significant impact among the groups.

3.6 Contributions, limitations and implications

The present research has significant implications in terms of three aspects:

Theoretically, the findings help to enhance the validity and reliability of the JDACS model, which has been a key anchoring point for research on the impact of work characteristics with respect to employee health and wellbeing for the past three decades (van Veldhoven, Taris, de Jonge, and Broersen, 2005). The central argument of JDACS model is the buffer hypothesis, which posits that job demand, job control and social support interact with each other to enhance wellbeing. Despite the popularity and prevalence of the JDACS model, empirical evidence supporting the seminal buffer hypothesis of this model has been marginal at best. Meta-analyses consistently fail to show adequate support for the buffer hypothesis of the JDACS (e.g., Häusser, Mojzisch,

Niesel, and Schulz-Hardt, 2010; van der Doef and Maes, 1999), even when controlling for methodological rigour (de Lange, Taris, Kompier, Houtman, and Bongers, 2003). The presented results provide new empirical evidence, especially for the Solo self-employed group, as this study found a significant moderating impact of social support. This adds weight to the JDCS buffering hypotheses and verifies the validity of the JDCS theory.

Methodologically, since the self-employed are a very heterogeneous group, previous research has experienced various methodological difficulties (e.g. sample and measurement biases etc.) in accurately measuring differences of work-related stress between the self-employed and employees. To account for these methodological difficulties, this study used a matching approach to show very different results of comparative studies on work-related stress between self-employed and employees, compared to prior studies (Patzelt and Shepherd, 2011; Baron, Franklin and Hmieleski, 2013; Hessels, Rietveld and Zwan, 2016). In fact, by controlling the sample selection bias, the solo SE experience lower work-related stress. In contrast, the SEE, they were found to have higher work-related stress than employees.

The dataset this study used is large, effectively representing the British population. Moreover, it classified the self-employed into solo self-employed and self-employed with hiring employees. Such a distinction was absent in prior studies of self-employment and stress. The distinction between these two groups proved to be important. And given the high-stress levels of SEE, the results indicate that the

self-employed with employees may be an important target group for stress reduction programs. A relevant route to alleviate stress among the self-employed with employees is the reduction of job demand and seeking more social support, as these factors partially explain the stress difference. Therefore, another relevant implication for further research is the investigation of work-related stress in terms of owner-managers who can share job demands of the business. Future studies may delve into the heterogeneity of self-employment jobs (Hundley, 2001), such as distinctions between opportunity and necessity self-employment and innovative and imitative self-employment (Cliff et al., 2006), to obtain an even more detailed picture of the relationship between self-employment and work-related stress.

This paper has some limitations. Firstly, due to the dataset's designed questionnaire, there was only one variable to measure job demand. As working hours is the most significant variable, and is highly objective, and easily and precisely measured in terms of quantitative measurement of job demand, it is believed that working hours can measure job demands efficiently. However, it would be better if future studies involved other items in measuring qualitative aspects of job demands. Also, the measurement of social support lacks considerations of support occurring in the workplace and from the government. In particular, there has been widespread argument about how to measure social support (Beehr et al., 1990) A considerable amount of research has indicated that both work- and non-work related social support reduces, or buffers, the adverse impact of exposure to work-related job stress (Dollard et al., 2000), which need to be taken in

the future studies.

In terms of further implications, theoretically, the self-employed are highly dynamic individuals, and this paper captured the different findings by distinguishing between the self-employed with hiring employees and the solo self-employed. This implies the necessity to consider the characteristics of various categories of the self-employed in research. Methodologically, the matching approach can play a vital role in multi-group analyses. For policymakers, a future focus may emphasise how to develop stress coping mechanisms for those self-employed who hire employees, as they appear to experience the highest work-related stress; moreover, they have high relevance in terms of economic growth and contributions to the labour market. In addition, as a matter of the fact, the SEE is a small percentage of the self-employed population but significantly contributes to economic development. It reduces the unemployment rate not only by giving employees a job but also by providing more jobs for others. Moreover, SEE has a much greater possibility to develop into a large size company, which may have a greater economic impact (Casson, 1982). However, this population group has been largely ignored by current entrepreneurship field and policymakers largely, thus call future study making great endeavor to explore this issue.

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Chapter 4 Work-related stress and Job satisfaction of the Self-employed: coping effect of self-efficacy

4.1 Introduction

‘Instead of traditional organisational structures that heavily rely on management control and economic principles of cost reduction, efficiency, and cash flow, the focus in modern organisations is in the management of human capital.’ (Bakker and Schaufeli, 2008: 29) By drawing the positive psychology, that is, ‘what is good about life is as genuine as what is bad and therefore deserves equal attention’ (Peterson, 2006: 4), the recently emerging field of positive organizational behavior, or simply POB, which attempts to give a renewed emphasis to the importance of a positive approach. A recent survey of the articles in the occupational health literature found about a ratio (of positively to negatively focused articles) of 1 (positive) to 15 (negative) (Schaufeli and Salanova, 2007). Thus, the current organisational behaviour academia calls for a more positive approach than the dominant negative perspective regarding occupational stress and workplace wellbeing urgently. In light of this significant gap, this study aims to apply the POB as the foundation for the present study.

Luthans (2002:59) defines POB as ‘the study and application of positively oriented human resource strengths and psychological capacities that can be measured, developed, and effectively managed for performance improvement in today’s workplace’. POB originates from positive psychology but transplanted to the world of work and organisations, and it constitutes the study of positive human strengths and competencies, how it can be assessed, facilitated and managed to improve performance in the workplace. Moreover, POB emphasised the employees who hold hope spend

energy on meeting goals and using willpower to face challenges. The objective of POB is creating determined employees who can seize alternative solutions to complete the task when problems arise and can regard problems at work as challenges and more effectively produce results beneficial to the organisation. Besides positivity, to be included as a psychological capacity within this defined POB framework, it must meet the following criteria: (a) The capacity must be theory and research-based and validly measurable, and (b) the capacity must also be 'state-like' (i.e., open to change and development) and have a demonstrated performance impact (Luthans, 2002a, 2002b; Luthans, Youssef, et al., 2007). In its emphasis on theoretical grounding, valid measurement, and rigorous research, POB stands in stark contrast to the exponentially expanding body of popular best sellers, which share its positivity but lack theory, measurement, and empirical support. Particularly, the state-like criterion of POB emphasises on micro, individual-level constructs, which separates it from other positive perspectives that address positive organisations and their related macro-level variables and measures (Luthans, Youssef, et al., 2007).

In the past, entrepreneurial success has almost exclusively been defined regarding financial outcomes (ROI, profits, growth in sales, etc.) and nowadays, the 'entrepreneurial success' needs somewhat broader definitions (Baron, Franklin and Hmieleski, 2016). There is currently growing recognition in the field of entrepreneurship that, aside from purely financial goals, they are also caring about the influence of self-employment on their wellbeing (Baron, Franklin and Hmieleski,

2017). Indeed, the workplace wellbeing of the self-employed would be an interesting topic to study. Empirically, compared with wage-paid employees, self-employed may experience greater challenges arising from uncertainties, complexity, risks and pressures in the process of running a business (Baron, Franklin and Hmieleski, 2017). These particular situations and challenges mean that the self-employed may experience considerable work-related stress, which is the negative side of workplace wellbeing. On the other hand, evidence from previous research indicates that the self-employed present the higher levels of job satisfaction, which is the positive side of workplace wellbeing, than those who are the wage paid employees (Blanchflower et al., 2001; Bradley and Roberts, 2004). Thus, for the self-employed, there is a greater possibility to experience both negative and, positive wellbeing.

When the POB theory is applied to entrepreneurship, an intriguing possibility emerges. It is emphasised that when the self-employed navigate the ever-challenging work environment, they increasingly recognise the importance of positivity and concentrate on enhancing their strengths, rather than dwell on the negative and trying to fix the self-employment's vulnerabilities and weaknesses. Thus, from the POB perspective, one explanation of the self-employed has possibility to experience both higher level of negative workplace wellbeing and positive workplace wellbeing, can be assumed as the self-employed have a better psychological capability to cope with negative workplace wellbeing and enhance positive workplace wellbeing (Bradley, and Roberts, 2004). In addition, due to POB emphasises how the added value of positivity over and

above the negativity, therefore, a question of how to cope with negative workplace wellbeing and enhance positive workplace wellbeing of the self-employed can be regarded as an essential topic within POB as well. One significant element of the psychological capability of the coping mechanism of the self-employed assumed in this paper is self-efficacy.

Self-efficacy has been defined in the workplace as ‘one’s conviction (or confidence) about his or her ability to mobilise the motivation, cognitive resources, and courses of action needed to execute a specific task within a given context successfully’ (Stajkovic and Luthans, 1998:66). Among the POB criteria-meeting capacities selected for inclusion, Self-efficacy represents the best fit to all the criteria (Luthans, 2002). As it has the most established theoretical foundation and has been primarily supported (Bandura, 1997) and measured (e.g., Maurer and Pierce, 1998; Parker, 1998) as a state. Aside from the theory contribution, more importantly, self-efficacy can be practically developed through modelling and vicarious learning from others’ successful experiences, formal and informal training programs, mastery and vicarious experiences, social persuasion through positive feedback, group support and encouragement, respect, and trust (Fredrickson, 2001, 2003). In entrepreneurship research, self-efficacy is always linked with entrepreneurial intentions (Boyd, and Vozikis, 1994; Wilson, Kickul, and Marlino, 2007), performance (Hmieleski, and Baron, 2008; Markman, Balkin, and Baron, 2002) and measurements of an entrepreneur (Chen, Greene., and Crick, 1998; Singh, and DeNoble, 2003). Few have focused on its impact on the wellbeing of the

self-employed. Moreover, In the field of entrepreneurship, there is a dearth of research on the coping mechanisms for work-related stress, and scholars have recently called for further research on this topic (Shepherd and Patzelt, 2015; Baron et al., 2016). Therefore, this study aims to shed some light on how self-efficacy helps the self-employed cope work-related stress and increase job satisfaction. Moreover, this study will delve this issue by comparing the coping mechanism of self-efficacy between the self-employed and employees.

This study sets out to answer the following questions in this paper, firstly, do the self-employed have a higher level of job satisfaction than employees? Secondly, what's the relationship between work-related stress and job satisfaction? Thirdly, does self-efficacy can effectively moderate the relationship between work-related stress and job satisfaction? The dataset is sourced from Understanding Society; the largest UK household dataset consisted of 12162 observations (Employees: n=10481; self-employed: n= 1681).

This study aims to contribute the current knowledge in three ways. Firstly, it will test the relationship between the positive and negative side of workplace wellbeing, which has not understood thoroughly by previous studies. Secondly, previous entrepreneurship research tends to relate self-efficacy to work-related performance outcomes (e.g., Bandura and Locke, 2003; Stajkovic and Luthans, 1998) rather than the coping mechanisms for work-related stress and enhance job satisfaction. Thus, we will add the knowledge of how Self-efficacy associate with work-related stress and job

satisfaction among working people and self-employed. This study aims to test the moderating coping mechanism of self-efficacy on the relationship between work-related stress and job satisfaction by entrepreneurial evidence. Thirdly, this paper will use matching approach to updating the dataset and eliminate the selection bias, which has been identified as one of major problems within the comparative analysis, which has employed the large dataset to select sub-sample (Rosenbaum and Rubin, 1985). It is believed that by applying this method, controlling the selection bias between groups can be more accurate for researchers dealing with group differences and can shed some light on the research approach for the further multi-group research.

4.1.1 Prior studies of coping mechanisms for work-related stress in entrepreneurship

In previous research, coping is defined as ‘a process of managing taxing circumstances, expending effort to seek solutions to personal and interpersonal problems, seeking to manage, minimise, reduce or tolerate stress induced by unpleasant and stressful situations (Wong, Yik and Kwong 2006:194). In the field of entrepreneurship, research on the work-related stress coping mechanism of self-employed has recently gained attention (Shepherd and Patzelt, 2015; Baron et al., 2016). There are some papers on the coping mechanism of self-employed dealing with work-related stress. This study summarises these prior studies of investigating the differences in coping with work-related stress among the self-employed in Table 18. Three approaches have been identified of which researchers used to explore the coping mechanism among the

self-employed. The first one is the external coping approach. Previous research adopting this approach focus on the factor of social supports, for example, support from partners, family and friends or business networks. However, the effect of social support on work-related stress from the prior studies is inconsistent. For example, Pollack, Vanepps and Hayes(2012) found that the self-employed with larger quantities, and with higher frequency of contacting external business relationships experience lower work-related stress. Tetrick et al.(2000) studied US licensed morticians owners and found that Social supports only have significant moderating effects rather than the direct effect on self-employed. However, Ahmad and Salim(2009) used a 118-Malaysian business owners dataset fail to verify the relationship between networking and work-related stress. The second is the workplace coping approach. This approach aims to identify effective coping resources or factors in the workplace, such as job demands, job control, the content of tasks, and characters of the working environment. Research following this approach has found that many of these workplace factors are significantly related to work-related stress, For example, job demand (workload) (Terick et.al,2000; Hessels,Rietveld and Zwan,2017) and job control(job autonomy) (Hessels,Rietveld and Zwan,2016; Prottas and Thompson,2006) have been found to have a close association with work-related stress among American and Australian self-employed. The content of tasks, such as venture demand, variety and ambiguity within the personal daily tasks(Terick et.al,2000; Wincent and Örtqvist, 2009) and characters of work-environment (e.g. complexity, changeable and variety of

organization strategy)(Wincent and Örtqvist, 2009) are significantly related to work-related stress of self-employed individual from America and Sweden. The third is the personal coping mechanism approach. One of the popular focal of previous research is the personal strategies or style of coping work-related stress. For example, Drnovsek, Örtqvist, and Wincent (2010); Brink and Rey(2001) and Patzeltand Shepherd(2011) separate self-employed into problem-based(focus), and emotional based(focus) types and found problem-based coping strategy effectively helps self-employed reduce work-related stress. Örtqvist, Drnovsek, and Wincen (2007), Oren(2012) and Uy, Foo and Song(2013) revealed that self-employed individuals with an active coping strategy experience lower level of work-related stress than self-employed individuals who used passive coping strategy. Perry and Penney (2008) tested with 226 American self-employed and found that two personality characters of self-employed, neuroticism and conscientiousness, are closely associated with reduced work-related stress.

Above all, support from outside of the organisation is very complex and arduous for an individual to change and develop (Greve, and Salaff, 2003). For factors within the organisation, for example, job demand and job autonomy, the self-employed are highly driven by the business target. Sacrificing business benefits to adjust the appropriate amount of job demand and job autonomy is not realistic for the self-employed (Chay, 1993). Moreover, the majority of the self-employed are solo self-employed individuals, for them supports from colleagues or employees are impossible (Hessels, Rietveld and Zwan,2017). Thus, the trend of current research is more focused on the factors that can

be empirically developed at the individual level (Baron, Franklin and Hmieleski,2016). One recent study suggests that the psychological capital of individual is a valuable personal asset for self-employed to cope with work-related stress as the malleable nature of psychological capital offers an opportunity for self-employed to strengthen their psychological capital and that of their employees (Baron, Franklin and Hmieleski,2016). Self-efficacy as the core element of psychological capital should be highly taken into consideration (Bradley, and Roberts, 2004).

Table 18 Prior studies of investigating coping work-related stress of self-employed. Studies are ordered by the date

Study	Sample	coping factors	Method	Significance
Terick et.al(2000)	160 US licensed morticians owners, employees and managers	social support, workload, job-personal conflict, work ambiguity and role conflict	MANOVA and moderated hierarchy regressions	Workload and work ambiguity is significant. Social supports only have significant moderating effects
Brink and Rey(2001)	110 woman south Africa self-employed	emotional and problem-focused coping	mix methods	significant
Prottas and Thompson(2006)	US 2002 national study of Changing workforce(NSCW):3504 self-employed and employees	Job autonomy	mean differences and Multivariate Analysis	significant
Drnovsek, Qrtqvist and Wincent(2007)	469 Slovenian and Swedish self-employed	Structural role redefinition, personal role redefinition, reactive role behavior, and passive role behavior.	Profile analysis and structural equation modeling	significant
Perry and Penney(2008)	226 U.S. self-employed	personality: neuroticism and conscientiousness	Hierarchical Multiple Regression	significant
Wincent and Qrtqvist(2009)	282 Swedish self-employed	venture technology, venture environment, personality	structure equation model	significant
Ahmad,Salim(2009)	118 Malaysian self-employed	prioritize work, effective communication, disregarding, divert thinking, networking, exercise regularly	Online Analytical Processing (OLAP) Cubes	disregarding, divert thinking and effective communication is significant
Drnovsek,Qrtqvist and Wincent(2010)	3600 European self-employed	problem-based and emotions-based coping	structure equation model	problem-based coping strategy is significant
Patzeltand Shepherd(2011)	1996 General Social Survey (GSS):2700 US self-employed and employees	problem-focused and emotions-focused coping	hierarchical regression analysis	significant
Oren(2011)	308 Israel self-employed and employees	active and passive coping strategies	mean differences	significant
Uy, Foo and Song(2012)	156 Philippines self-employed	active and avoidance coping strategies, entrepreneurial experiences	Hierarchical Multiple Regression	active coping strategy is significance
Pollack, Vanepps and Hayes(2012)	262 US self-employed	social ties	Multiple OLS Regression	significant
Hessels,Rietveld and Zwan(2016)	Household, Income and Labour Dynamics in Australia (HILDA) survey(2005-2013):15837 self-employed and employees	Job Demand and Job Control	multivariate analyses	significant
Baron, Franklin and Hmieleski(2016)	2000 US business founders(2005-2010)	psychological capital	mean-scored, hierarchy regression and mediation analysis	significant

4.1.2 Prior studies of job satisfaction and the relationship between work-related stress and job satisfaction in entrepreneurship

Regarding with job satisfaction, which is the positive conclusion of career experience has received far more attention than work-related stress. According to Monitor 2013 Global Report, ‘Entrepreneurs are among the happiest individuals across the globe when it comes to individual satisfaction with their work conditions.’ (Amorós and Bosma, 2013). This report serves as a trigger of interest in the further investigation into the topic of job wellbeing in entrepreneurship. Table 19 presents the major journal papers on the theme of job satisfaction within entrepreneurship. From the Table 19, it can be seen that the earliest research on job satisfaction since 1995, only 20 years ago, recently, after 2010, the increased number of papers published in top journals, including Journal of Business Venturing, Entrepreneurship Theory and Practice etc. The majority researches were conducted in the USA, EU countries with the large national dataset. However, most data sets used in the researches were collected before 2010. There are three main questions these researches focus on: 1) the comparison of job satisfaction between the self-employed and employees. 2) Factors contribute to job satisfaction 3) the impact of the self-employed’s job satisfaction. For the first question, except the study conducted by Jamal(1997), who used the 235 Canadian self-employed and employees sample, found that no significant differences between self-employed and non-self-employed individuals in term of job satisfaction, the conclusion of self-employed are more satisfied with job compared with their wage-paid counter

partners were verified by the majority studies from many countries all over the world. For example, Benz and Frey (2004) used a 23 countries sample with 14041 self-employed and employees found that the higher job satisfaction among the self-employed can be directly attributed to the greater independence and autonomy they enjoy. Representative U.S. samples showed that self-employed feel a higher satisfaction with their jobs than regular employees (Thompson, and Prottas,2006; Hundley, 2001; Schjoedt and Shaver,2007). Similar results that indicate the self-employed have higher job satisfaction were found in studies with large panel dataset of other countries as well(Benz and Frey,2004; Benz, and Frey,2008; CooperandArtz,1995; Millán, Hessels, Thurik and Aguado,2013; Schneck,2014; Hanglberger and Merz,2015; Lange,2012). Regard with the second question, various factors have been tested to predict job satisfaction at the individual level, organisational level and society level by existed researches. For example, the self-efficacy has been verified has predicting power on job satisfaction in America and Singapore (Hmieleski, and Corbett,2008; Lee, Wong, Der Foo, and Leung(2011). Some studies also found the innovation-related factor also can simulate the job satisfaction. For example, Feldman, and Bolino(2000) revealed a desire for entrepreneurial creativity affect job satisfaction. Lee, Wong, Der Foo, and Leung(2011) found that individual's innovation orientation strengthens the work-environment to the job-satisfaction relationship. However, the results on testing personality's impact on job satisfaction are inconsistent. Lange (2012) verified the significance of personality trait's impact on the self-employed's job

satisfaction. However, Gupta and Muijt (2012) found that entrepreneurial personality and job satisfaction was not statistically significant. Moreover, regarding the individual variable, Cooper, and Artz (1995) found that the particular entrepreneurial objectives, personality, and backgrounds are likely to be associated with greater satisfaction. At the organisational level, job characters are closely related to job satisfaction, previous studies (Schjoedt,2009; Parasuraman, Purohit, Godshalk and Beutel,1996) tested and verified the job involvement and family-work conflict affect career satisfaction. Lange (2012) found that the higher job satisfaction of the self-employed due to large extent of job autonomy. Van and Adonisi (2008) found that the self-employed's work discretion, work improvement and rewards/reinforcement have an impact on job satisfaction. At the society level, Yetim, and Yetim,(2006) used the Turkey sample to test and confirm socio-cultural backgrounds affect job satisfaction of the self-employed. The other paper listed in the Table 19 focus on the third question, the impact of the self-employed's job satisfaction. For example, Noorderhaven, Thurik, Wennekers and Stel(2004) discovered that dissatisfaction at the level of societies has a positive and significant influence on self-employment income levels. Kautonen Hytti, Bögenhold, and Heinonen(2012) revealed that job satisfaction is a significant determinant of the intention to retire later and prolong the career life of individuals. Also, job satisfaction variables significantly affect transition probabilities of both self-employment candidates and job quitters, moreover, the results showed that individuals that transit from self-employment to wage-employment have improved their income, life and job satisfaction (Guerra and

Patuelli,2016; Mattes, 2016)

However, among these researches, only a few types of research discuss the relationship between these two facets of the workplace wellbeing, the job satisfaction and work-related stress (Jamal,1997; Prottas and Thompson,2006; Tetrick, Slack, Da Silva, and Sinclair,2000; Bradley, Roberts,2004). Jamal(1997) and Prottas and Thompson(2006) examined the differences in job satisfaction, stress between full-time self-employed and organizational employees in their study. Jamal(1997) found that the self-employed experienced higher job stress, and, no significant differences were found between self-employed and non-self-employed in job satisfaction. Prottas and Thompson(2006) found that the self-employed experience higher job satisfaction, no significant differences were found between self-employed and non-self-employed in job stress. However, the main purpose of these two researches are the comparison between the self-employed and employees, the negative relationship between job satisfaction and stress only been presented in bivariate correlations test and has not been discussed as a main question. Tetrick,Slack,Da Silva,and Sinclair, (2000) raised a stressor-strain-outcome model to examine the relationship between stress, strain and job satisfaction among the self-employed and employees. They found that emotional exhaustion partially mediate the effect of the perceived stressors on job satisfaction; the perceived stressors explained a significant amount of the variance in both job satisfaction and professional satisfaction after controlling for emotional exhaustion and social support. Bradley and Roberts (2004) used The National Survey of Families and

Households: Wave I, 1987–1988, and Wave II 1992–1994 sample and found that a portion of the association between job satisfaction and self-employment can be explained by higher levels of self-efficacy and by lower levels of job stress (job depression) among the self-employed compared to others.

In conclusion, current researches on job satisfaction and work-related stress within entrepreneurship mainly focus on doing the comparative analyses between the self-employed and employees. A few study tested the various factors contribute to the job satisfaction and work-related stress, but the majority of them lack strong theoretical support or model-based system perspective. Moreover, research on the relationship between the job satisfaction and stress, the two main sides of the workplace wellbeing, is largely non-existent in the entrepreneurial field.

Thus, this study aims to discuss these two significant subjects of the self-employed's wellbeing and how the self-efficacy helps self-employed cope work-related stress and increase their job satisfaction. In addition, this paper also do the comparative analysis between the self-employed and employees

Table 19 Prior studies of job satisfaction among the self-employed. Studies are ordered by the date

Study	Sample size	Place	Year of Data Collected	Journal	Topic	Results
Cooper, and Artz,(1995)	287 entrepreneurs	America	1985-1987	Journal of Business Venturing	Factors contribute to job satisfaction	Particular goals, attitudes, and backgrounds are likely to be associated with greater satisfaction
Parasuraman, Purohit, Godshalk and Beutell(1996)	111 business owners	America	1995	Journal of vocational behaviour	Factors contribute to job satisfaction	job involvement and family to work conflict affect career satisfaction
Jamal(1997)	235 self-employed	Canada	1996	Journal of Business Management	Small comparison between self-employed and employees	No significant differences were found between self-employed and non-self-employed in job satisfaction
VandenHeuvel, and (1997)	1,317 self-employed and employees	Australian	1994	Journal of business management	small comparison between self-employed and employees	Self-employed contractors who were independent of the hiring organisation were more satisfied than both other self-employed workers and wage and salary earners. However, contractors who were dependent on the recruitment firm were no more satisfied.
Feldman, and Bolino(2000)	153 self-employed	America	1999	Journal of Business Management	Small Factors contribute to job satisfaction and comparison between self-employed and employees	Desire for entrepreneurial creativity affect job satisfaction
Tetrick,Slack,D a Silva,and Sinclair(2000)	160 licensed morticians	America	2000	Journal of occupational psychology	of Factors contribute to job satisfaction and comparison between self-employed and employees	Business Owners higher levels of job satisfaction, Social support moderate the relationship between emotional exhaustion and job satisfaction
Hundley,2001	9187 self-employed and employees	America	1977-1997	Industrial Relations: Journal of Economy and Society	Factors contribute to job satisfaction	The self-employed job satisfaction advantage is relatively small or nonexistent among managers and members of the established professions—occupations where organisational workers have relatively high autonomy and skill utilisation.
Benz and Frey (2004)	14041 self-employed employees	23 countries	1984-1999	Swedish Economic Policy Review	comparison between self-employed and employees	Higher job satisfaction among the self-employed can be directly attributed to the greater independence and autonomy they enjoy

Blanchflower,(2004)	7204 self-employed and employees	11 countries	EU	1997	Labour Economics	Description of self-employment	of The self-employed are more satisfied with their job
Bradley, Roberts(2004)	13008 self-employed	America		1987–1988 and 1992–1994	Journal of small business management	Factors contribute to job satisfaction	Self-efficacy and job depression contributed to job satisfaction
Noorderhaven, Thurik, Wennekersand Stel(2004)	15 country-level variables	15 countries	EU	1978-2000	Entrepreneurship Theory and Practice	Job satisfaction works on rate of self-employment	Dissatisfaction at the level of societies has a positive and significant influence on self-employment levels
Protas, Thompson,(2006)	3504 self-employed and employees	America		2002	Journal of occupational health psychology	of comparison between self-employed and employees	Both business owners and independents are more satisfied with their lives than employees
Yetim, Yetim,(2006)	217 male SMEs entrepreneurs and 1140 employees	Turkey		1999	Social Indicators Research	Factors contribute to job satisfaction	socio-cultural backgrounds affect job satisfaction
Schjoedt Shaver(2007)	1,261 nascent entrepreneurs and others	America		1998-2000	Entrepreneurship theory and practice	comparison between self-employed and employees	nascent entrepreneurs have a higher mean of job satisfaction
Benz, Frey(2008)	Three country-level variables	German, British and Switzerland		1984-2000	Economica	comparison between self-employed and employees	Self-employed derive higher satisfaction from work than those employed in organisations, irrespective of income gained or hours worked
Hmieleski, Corbett(2008)	159 entrepreneurs	America		2007	Journal of business venturing	Factors contribute to job satisfaction	Entrepreneurial self-efficacy was found to have a negative moderating effect on the relationship between entrepreneur improvisational behaviour and work satisfaction
Kawaguchi(2008)	12686 self-employed and employees	America		1985-1998	Hitotsubashi Journal of Economics	comparison between self-employed and employees	Self-employed workers are more satisfied with their jobs than salary/wage-paid workers
Van Adonisi, (2008)	396 managers	South Africa		2007	South African Journal of Economic and Management Sciences	Factors contribute to job satisfaction	Work discretion, work improvement and rewards/reinforcement has impact on job satisfaction

Akehurst, Comeche, Galindo(2009)	114 firms and collaborators (members of managing teams)	228 Spain	2008	Small Business Economics	Job satisfaction works on Internal entrepreneurship	Job satisfaction has positive effect on Internal Entrepreneurship
Schjoedt(2009)	547 entrepreneurs and top managers	America	2008	Entrepreneurship theory and practice	Factors contribute to job satisfaction	Job characteristics were significant predictors of entrepreneurial job satisfaction
Kautonen and Palmroos(2010)	777 recently established microenterprises	Finland	2006	International Entrepreneurship and Management Journal	Factors contribute to job satisfaction	The adverse effect of a necessity-based start-up on subsequent entrepreneurial satisfaction
Lee, Wong, Der Foo, and Leung(2011)	4192 IT professionals	Singapore	2008	Journal of business venturing	Factors contribute to job satisfaction	Individual's innovation orientation strengthens the work-environment to the job-satisfaction relationship; self-efficacy reinforces the job-satisfaction to entrepreneurial intentions relationship.
Pagán-Rodríguez(2011)	9192 self-employed and employees	11 EU countries and 2007	2004	European Journal of Ageing	comparison between self-employed and employees	Self-employed persons are more satisfied with their jobs
Bianchi(2012)	50978 self-employed employees	46 countries	1981-2001	Review of Economics and Statistics	Factors contribute to job satisfaction and comparison between self-employed and employees	Entrepreneurs have higher job satisfaction than employees due to financial development
Gupta, and Muita(2012)	142 SMEs	America	2011	International Journal of Business and Management	Factors contribute to job satisfaction	Entrepreneurial personality and Job Satisfaction was not statistically significant
Kautonen Hytti, Bøgenhold, and Heinonen(2012)	1,262 white-collar professionals	Finland	2010	International Journal of Manpower	Predicting of retirement age	Job satisfaction is a significant determinant of the intention to retire later and thus prolong a career
Lange, (2012)	T. 11157 self-employed wage-paid workers	19 EU countries	2006	Small business economics	Factors contribute to job satisfaction	Personality traits, autonomy contributes to job satisfaction
Hytti, Kautonen and Akola(2013)	2327 self-employed and employees	Finland	2010	The International Journal of Human Resource Management	Comparison between self-employed and employees	Self-employed are significantly more satisfied with job, task significance, variety and autonomy have similar effects on the level of job satisfaction among both employees Moreover, self-employed individuals

Millán, Hessels, Thurik and Aguado(2013)	59604 self-employed and paid-employed people	15 countries	EU 1994-20 01	Small economics	business comparison between the	self-employed and employees	The self-employed are more satisfied with their job
Schneck(2014)	25 European countries	25 European countries	2010	Journal of Business Research	comparison between the	self-employed and employees	Self-employed are more satisfied with their jobs than employee
Hanglberger and (2015)	18587 self-employed and employees	German	1984-20 08	Journal of Labour Market Research	comparison between the	self-employed and employees	no specific long-term effect of self-employment on job satisfaction
Guerra and Patuelli(2016)	4713 employees	Switzerla nd	1999– 2008	Entrepreneurship Theory and Practice	predicting of self-employment transition	job satisfaction variables significantly affect transition probabilities of both self-employment candidates and job quitters	
Mattes(2016)	569 entrepreneurs	Australian	2001-20 12	International Journal of Entrepreneurial Behavior and Research	Predicting of entrepreneurial quit	Unsatisfied entrepreneurs that transition from self- to wage-employment improve their income, life and job satisfaction	

4.2 Theory and hypothesis

4.2.1 Job satisfaction and self-employment

Job satisfaction refers to one of job rewards, and career success (Hessels, Rietveld and Zwan, 2017). As noted before, many researchers have been attracted to compare job satisfaction between self-employed individuals and employed individuals. The majority of these studies found that self-employed individuals experience significantly higher level of job satisfaction than their wage-paid counterparts (Blanchflower and Oswald 1998; Benz and Frey 2004; Amorós and Bosma, 2014; Hundley 2001; Blanchflower and Oswald 1998; Thompson, Kopelman, and Schriesheim 1992), which already displayed in Table 19. Thus,

Hypothesis 1: H1: Self-employment is positively associated with job satisfaction.

4.2.2 Work-related stress and job satisfaction

Work-related stress has been found to be related to a wide range of harmful outcomes (Ganster and Rosen, 2013). For instance, it often, although not always, interferes with task performance and reduces personal health (DeLongis, Folkman, and Lazarus, 1988). One of the most direct reflections of work-related stress comes to reduce job satisfaction (Shepherd et al., 2009). Some studies have tried to determine the link between stress and job satisfaction. One study of general practitioners in England identified four job stressors (a. Demands of job and patients' expectations; b .

Interruptions; c. Practice administration; d Work: home interface and social life) that were predictive of job dissatisfaction (Cooper et al., 1989). In another study, Vinokur-Kaplan (1991) found that organisational factors such as workload and working condition are negatively related to job satisfaction. Fletcher and Payne (1980) revealed that a lack of satisfaction could be a source of stress, while high satisfaction can alleviate the effects of stress and that both of job stress and job satisfaction are interrelated. The study of Landsbergis (1988) and Terry et al. (1993) showed that high levels of work-related stress are associated with low levels of job satisfaction. Moreover, Cummins (1990) emphasised that job stressors have predictive power on job dissatisfaction and the intentions of leaving organisations. Self-employment is a very challenging job, as it requires hard work, long hours, emotional energy has heightened job stress, role ambiguity, and above all, contains high risk (Kaufmann 1999). Any benefits that may accrue to the self-employed are gained at the cost of increased risk. Therefore, the self-employed are exposed to many potential stressors, and exposure to such stressors may reduce self-employed' job satisfaction.

Thus

Hypothesis 2: work-related stress is negatively related to job satisfaction

Hypothesis 2a: work-related stress is negatively related with job satisfaction of the self-employed

Hypothesis 2b: work-related stress is negatively related with job satisfaction of employees

4.2.3 Coping process and self-efficacy

Self-efficacy refers to ‘beliefs in one's capabilities to mobilise the motivation, cognitive resources, and courses of action needed to meet given situational demands’ (Wood and Bandura, 1989: 408). Applying the concept to the workplace, it is defined as ‘an individual’s conviction about his or her ability to mobilise the motivation, cognitive resources, and courses of action necessary to successfully execute a specific task within a given context’ (Stajkovic and Luthans, 1998: 66). Self-efficacy is typically believed to be task specific (Bandura, 1997). For example, self-efficacy in a self-employment context has been defined regarding ‘the degree to which individuals believe they are capable of performing the tasks associated with new venture management’(Forbes, 2005:628). Efficacy beliefs have an impact on how individuals perceive and interpret events. Those with low self-efficacy are easily convinced that efforts to address difficult challenges are futile so are more likely to experience stress symptoms, while those with higher levels of self-efficacy are more apt to perceive challenges as surmountable given sufficient competencies and effort (Bandura, 2007). Compared with others, people with high self-efficacy may be more liable to demonstrate an intrinsic interest in the tasks they perform, may show greater persistence in the face of obstacles and setbacks, and may expend greater effort at their jobs (Chen, Greene, and Crick, 1998). Given these considerations, it can be argued that self-efficacy enhance the likelihood that a person’s enjoyment of occupational success and the satisfaction that

accompanies success (Judge and Bono 2001). Moreover, that self-efficacious persons tend to expend greater effort at work is important because invested effort may increase a person's tendency to evaluate positively outcomes earned using their exertions (Brown and Peterson 1994)

Thus,

Hypothesis 3: self-efficacy is positively related to job satisfaction

Hypothesis 3a: self-efficacy is positively related to job satisfaction of the self-employed

Hypothesis 3b: self-efficacy is positively related to job satisfaction of employees

Often associated with confidence (e.g., Stajkovic and Luthans, 1998), self-efficacy is operationalised regarding challenging self-set objectives, self-selection into difficult tasks, self-motivation, generous effort investment and mobilisation toward task mastery and goal accomplishment, and perseverance when faced with obstacles (Stajkovic and Luthans, 1998). Such self-directed initiatives reflect proactive discrepancy creation, rather than reactive discrepancy reduction, which less-confident people may passively display as they respond to challenges that are imposed on them by their external environments. Consequently, less-efficacious individuals are more prone to failure, despair, and losing confidence when facing with negative feedback, social disapproval, obstacles and setbacks, or even self-created challenges such as self-doubt, scepticism, or negative perceptions and attributions (Bandura and Locke, 2003). For example, Schaubroeck and Merritt(1997) pointed out that individuals high in self-efficacy believe that they can achieve whatever they set out to accomplish—that

they can, in essence, 'get the job done.' This may help the individual re-energised from the high-level stress, in other words, self-efficacy can weaken the relationship between work-related stress and job satisfaction.

Hypothesis 4: self-efficacy negatively moderates the relationship between work-related stress and job satisfaction

Hypothesis 4a: self-efficacy negatively moderates the relationship between work-related stress and job satisfaction in the self-employed group

Hypothesis 4b: self-efficacy negatively moderates the relationship between work-related stress and job satisfaction in the employee group

4.2.4 The self-employed and employees

Based on the above hypotheses, this study is expected to find the differences in the work-related stress coping mechanism between the self-employed and employees. As noted before, the self-employed may experience the different levels of job satisfaction (Lange,2012), self-efficacy(Bradley, and Roberts, 2004) and also work-related stress(Hessels, Rietveld and Zwan,2017). Moreover, job characters are also different from each other (Baron, Franklin andHmieleski, 2016). Role differences between self-employment and employment are well established in the academia (Hoang and Gimeno, 2009; Haynie and Shepherd, 2009). However, there is insufficient theory linking these role differences to discuss the relationships among work-related stress, job satisfaction and self-efficacy. Therefore, this study will base on the findings of

hypotheses tests between the self-employed and employees to suggest: if the findings between the self-employed and employees are different from Hypothesis 2: work-related stress negatively relate with job satisfaction among the self-employed Then this study suggests *Hypothesis2c: the self-employed moderate the relationship between job satisfaction and work-related stress.*

If the findings between the self-employed and employees are different from Hypothesis 3: self-efficacy is positively related to job satisfaction, then it suggests *Hypothesis3c: the self-employed moderate the relationship between self-efficacy and job satisfaction.*

If the findings between the self-employed and employees are different from *Hypothesis 4: self-efficacy negatively moderates the relationship between work-related stress and job satisfaction.* Then it suggests *Hypothesis4c: the self-employed moderate the relationship between the interaction term of self-efficacy*work-related stress and job satisfaction.*

4.3 Data and Methods

4.3.1 Dataset

The sample is selected as the respondents claimed themselves as the self-employed or employees in Understanding Society Questionnaire. Also, the observations need to answer the relevant questions from self-efficacy module (only available in wave 5) and workplace wellbeing module (available in wave 6) and other relevant questions. Thus, this study merges dataset of Wave 5 and Wave 6 to obtain data for all needed variables.

After sample selection, the dataset consists of 12162 observations (Employees: n=10481; self-employed: n= 1081).

4.3.2 Measurements

Job satisfaction, the dependent variable, job satisfaction is measured by the question ‘how dissatisfied or satisfied are you with your present job overall?’, the answers scale ranges from 1 completely dissatisfied to 7 completely satisfied.

Self-efficacy, the moderator, is measured by a set of 10 questions, the scale is sourced from Schwarzer and Jerusalem’s (1995) Generalised Self-Efficacy Scale (short form), which has been applied widely in the psychological and social studies (Chiu,2014). Exemplary questions include ‘Solve difficult problems if try hard enough’; ‘someone opposes me can find ways to get what I want’; ‘Easy to stick to aims and accomplish goals’; ‘Confidence can deal with unexpected events’. The answers are listed from 1 Not at all true to 4 exactly true. This study uses the principal factor analysis to generalise a principle factor to represent self-efficacy, with higher score, individual has higher level of self-efficacy (Cronbach’s $\alpha=0.87$)

Work-related stress, the Independent Variable, Understanding Society dataset automatically calculates two indexes to measure the two aspects of work-related stress: job anxiety and job depression, which is measured by using the job-related wellbeing scale developed by Warr (1990). This scale consists of two three-item subscales measuring ‘job-related depression’ and ‘job-related anxiety’. Both scales use a Likert-type response format and have demonstrated acceptable reliability and validity.

Here we reverse the score of the index to understand the stress easier. The reversed scores mean that people with a higher score experience a greater level of job stress. Kerr, McHugh, and McCrory (2009) and Rothmann (2008) have used this measurement to test job stress and wellbeing.

Demographic variables include age, sex, marriage status, education and monthly job-related income. For instance, women tend to report more psychosomatic symptoms (Jamal and Badawi 1995). Similarly, Jamal (1997) noted that age might play an important role: older people report more health problems than younger people do. Moreover, higher education may enlarge individual's employment opportunity and hence enhance the chance to find a more stratified job. The single person experiences higher job satisfaction due to the lack of family-work conflicts (Kristof-Brown, 2005). Therefore, consistent with previous research, all these Demographic variables are included as control variables. Moreover, higher income can increase job satisfaction (Kristof-Brown, 2005). All these variables will be controlled in the matching approach to establishing a comparable dataset, which will be explained in the next part.

4.3.3 Methods

To test the hypothesis, the paper will research three steps:

The first step is to establish a comparable data pool by using the Matching approach.

Observations are classified into two groups by the respondents' job (the self-employed:1, employees:0). The second step is to assess the mean differences of work-related stress, job satisfaction, self-efficacy between groups after matching. This

aims to test Hypothesis 1: Self-employed (solo self-employed and self-employed with hiring employees) experience less work-related stress than individuals in wage work. Moreover, Hypothesis 2: self-employed has a higher level of job satisfaction. The third step is to test Hypothesis 3 and Hypothesis 4. This study will use hierarchical regression models to test the moderating effects in the framework. Firstly, this paper will test the direct effects of work-related stress and self-efficacy on job satisfaction within the whole dataset and between the self-employed and employees respectively. Then the interaction terms of the self-employed and work-related stress (job anxiety*the self-employed; job depression* the self-employed); self-employed and self-efficacy (self-efficacy*the self-employed) will be added into the model to test group differences between the self-employed and employees on the relevant variables. Lastly, the interaction term work-related stress and self-efficacy (work-related stress* self-efficacy) will be added into the model to test the moderating effect of Self-efficacy on the relationship between work-related stress and job satisfaction in both occupational groups.

The matching approach

This study will use R software to run the Matching approach by applying the software package of 'Matchit'. To be more specific, this study control the rationale of the treatment group population to control group population group as 1:1, so that is 1681 (self-employed): 1681 (employees) and after matching, the distributions of propensity scores tend to be similar between the two groups (see in Figure 7). Also, it can be seen

that the demographical differences among control variables have been widely reduced. The T-test p-values results are presented in Table 20. None of them displays a significant difference in demographic variables between self-employed and employed.

Figure 6 Test Model

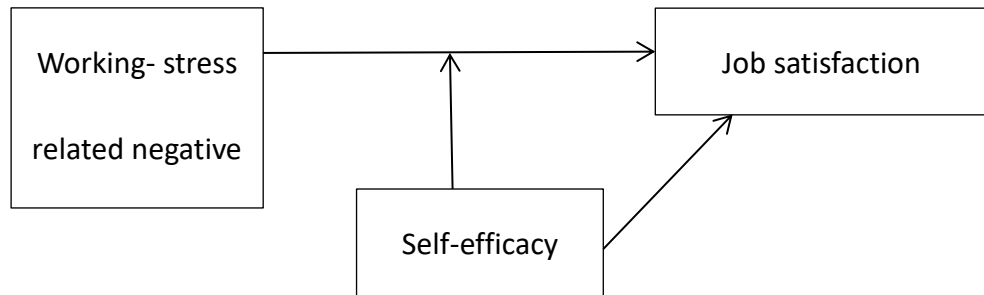


Figure 7 Distribution of Propensity Scores: Self-employed VS Employees

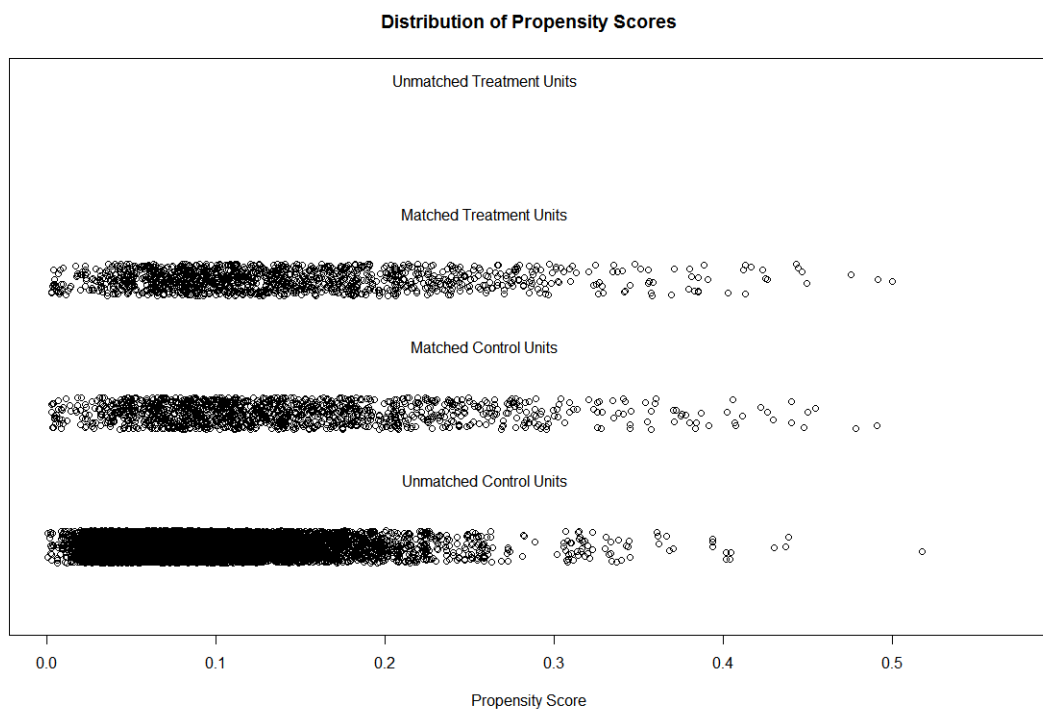


Table 20 Mean, Mean Differences, T-test of Control Variables Before and After Matching

	self-employed	employee(before matching)			employee(after matching)		
	mean	mean	mean diff	t-test	mean	mean diff	t-test
age	49.17	43.34	5.83	0	49.69	-0.52	0.24
gender	1.39	1.53	-0.14	0	1.38	0.01	0.62
education	2.86	2.74	0.12	0.01	2.89	-0.03	0.74
income	7.06	7.39	-0.33	0	7.12	-0.06	0.12

4.4 Results

Descriptive statistics – means and standard deviations – are presented in Table 21 for individuals of the whole dataset (N=12162), for employees (N = 10481) and the self-employed (N = 1081). Regarding the control variables, it is observed that the self-employed are more often male (the self-employed:61%; employees: 47%), older (the self-employed:49.17; employees:43.34), and with a higher level of education (the self-employed:2.86; employees:2.74) than wage-paid workers. For gender and age, these patterns are common in other dataset used in previous data (Simoes et al., 2015), whereas for income, contradictory evidence has been found in the earlier literature (Van der Sluis et al., 2008). The self-employed have lower incomes than the wage-paid workers (Sorgner et al., 2014).

Table 21 Variables Description

	Whole dataset (n=12162)		Self-employed (n=1681)		Employees (n=10481)	
	mean	sd	mean	sd	mean	sd
Job satisfaction	5.69	1.13	5.92	1.08	5.65	1.13
Job anxiety	2.69	1.44	2.78	1.58	2.69	1.41
Job depression	1.58	0.99	1.5	0.95	1.58	1
Self-efficacy	31.87	4.03	32.46	4.05	31.77	4.02
Age	44.14	12.69	49.17	12.05	43.34	12.61
Gender	0.51	0.5	0.39	0.48	0.53	0.5
Education	2.75	1.77	2.86	1.96	2.74	1.74
Income	7.34	0.87	7.06	1.24	7.39	0.78

Table 22 Binary Correlation Matrix

	1	2	3	4	5	6	7	8
Job satisfaction								
Job anxiety	-0.19***							
Job depression	-0.30***	0.42***						
Self-efficacy	0.12***	-0.12***	-0.16***					
Age	0.07***	-0.05***	-0.05***	0.04***				
Gender	0.06***	-0.03**	-0.03***	0.11***	-0.02			
Education	0.04***	-0.14***	-0	0.11***	0.18***	-0.02*		
Income	0.01	-0.13***	-0.05***	0.16***	0.03***	-0.29***	0.27***	
Job identity	0.08***	-0.02*	-0.03**	0.06***	-0.16***	0.10***	-0.02**	-0.13***

*** p<.001

** p<.01

* p<.05

To test *Hypothesis 1: Self-employment will be associated positively with job satisfaction*; this study makes the comparisons both in the before- and after-match sample. With the original dataset (before matching), it is observed in Table 23 that the mean of job satisfaction is higher among the self-employed individual than among the employed people (the self-employed:5.92; employees:5.65), By using the matched

dataset, We can see from Table 23, job satisfaction is still statistically significantly higher among the self-employed group($p < 0.01$) This result is consistent with previous research that the self-employed have higher job satisfaction. (Blanchflower and Oswald 1998; Benz and Frey 2004)

Table 23 Mean, Mean Differences, T-test of Independent and Dependent Variables Before and After Matching

	self-employed		employee(before matching)		employee(after matching)		
	mean	mean	mean diff	t-test	mean	mean diff	t-test
job satisfaction	5.92	5.65	0.27	0	5.63	0.29	0
job anxiety	2.78	2.69	0.09	0.02	2.49	0.29	0
job depression	1.5	1.58	-0.08	0	1.56	-0.06	0.09
self-efficacy	32.46	31.77	0.69	0	31.86	0.6	0

The results for testing the *Hypothesis 2: work-related stress is negatively related to job satisfaction among the self-employed; Hypothesis 2a: work-related stress is negatively related to job satisfaction among the self-employed; Hypothesis 2b: work-related stress is negatively related to job satisfaction among employees* are presented in Table 6. With respect to Hypothesis 2, the result shows that there is a direct negative influence of Job anxiety (whole dataset: coefficient=-0.05, $p<0.001$, self-employed: coefficient=-0.06, $p<0.001$; employees: coefficient=-0.08, $p<0.001$) and job depression (whole dataset: coefficient=-0.28, $p<0.001$, self-employed: coefficient=-0.23, $p<0.001$; employees: coefficient=-0.29, $p<0.001$) on job satisfaction. This finding provides support for Hypothesis 2.

Concerning *Hypothesis 3: self-efficacy is positively related to job satisfaction; Hypothesis 3a: self-efficacy is positively related to job satisfaction among the self-employed. Hypothesis 3b: self-efficacy is positively related to job satisfaction among the employees*, the results found that both in the self-employed and employees group, self-efficacy is positively related to job satisfaction (whole dataset: coefficient=0.03, $p<.001$, self-employed: coefficient=0.03, $p<.001$; employees: coefficient=-0.03, $p<.001$). This finding provides support for Hypothesis 4.

Regarding the moderating Hypothesis 5: self-efficacy negatively moderates the relationship between work-related stress and job satisfaction. Hypothesis 5a: self-efficacy negatively moderates the relationship between work-related stress and job satisfaction. Hypothesis 5b: self-efficacy negatively moderates the relationship

between work-related stress and job satisfaction. This study adds the interaction term of job depression*self-efficacy and an interaction term of Job anxiety* self-efficacy into the model. The results find that the significance of interaction terms varies among different groups. Specifically, for the whole dataset and self-employed group, the interaction between self-efficacy and job anxiety has no significance (whole dataset: coefficient=0; $p>.05$; self-employed: coefficient=0.01; $p>.05$), but the interaction between self-efficacy and job depression shows negative significance (whole dataset: coefficient=-0.02; $p<.05$; self-employed: coefficient=-0.01; $p<.05$). Regarding the employees, both interaction terms show significance in the moderating model (Job Anxiety*self-efficacy: coefficient=-0.13; $p<.05$; job Depression*self-efficacy: coefficient=-0.02; $p<.05$). Thus, *Hypothesis 5a: self-efficacy negatively moderates the relationship between work-related stress and job satisfaction in the self-employed group* is partly verified. And, *Hypothesis 5b: self-efficacy negatively moderates the relationship between work-related stress and job satisfaction in the employee's group* is tenable for both interactions terms.

Based on the above findings, this study turn back to analysis the group differences on *Hypothesis2c: the self-employed moderate the relationship between job satisfaction and work-related stress.* and *Hypothesis3c: the self-employed moderate the relationship between self-efficacy and job satisfaction.* Regarding these hypotheses based on the differences between the self-employed and employees, this study run the test by introducing interaction term of job depression* the self-employed, job anxiety*

the self-employed and self-efficacy* the self-employed (see in Table 24) in to the model. As a result, the only the interaction term job depression* the self-employed shows negative significance (coefficient=-0.06; $p < 0.05$), which means the relationship between job depression and job satisfaction is weaker in the self-employed group.

Regarding *Hypothesis 4c: the self-employed moderate the relationship between the interaction term of self-efficacy*work-related stress and job satisfaction*, which aim to test the differences of interaction terms job anxiety*self-efficacy and job depression*self-efficacy between the self-employed and employees, as *Hypothesis 4a: self-efficacy negatively moderate the relationship between work-related stress and job satisfaction in the self-employed group* is verified only in terms of job depression * self-efficacy, and *Hypothesis 4b: self-efficacy negatively moderates the relationship between work-related stress and job satisfaction in the employees group* is tenable for both interactions terms, which indicate that *Hypothesis 4c: the self-employed moderate the relationship between the interaction term of self-efficacy*work-related stress and job satisfaction* is supported. The results show that only the interaction term of job depression*self-efficacy has a weaker impact on job satisfaction in the self-employed group than in the employees group.

Regarding the size of the observed effects in our models, a commonly used measure is the explained variance (R^2) of the model. Cohen (1988) argued that a change in R^2 of 0.01 between models denote a small effect of the variables added, a change of 0.09 a medium effect, and a change of 0.25 a large effect. This means that the addition of the

main effects of our predictor variables to the base model results in a medium (joint) effect (change in pseudo-R²=0.082), and the further addition of interactions is a large (joint) effect (change in pseudo-R² around.1 in the three group). This is consistent with studies reporting effect sizes for interactions to be typically small and to range from 0.01 to 0.02 in field studies (Champoux and Peters, 1987). This study calculated three models in the whole dataset, in the self-employed group and employees group. First, we entered the control variables Age, Gender, Education and Income. This base model is statistically significant (whole dataset: R²=0.02, p<.001; Self-employed: R²=0.02, p<.001; Employees: R²=0.02, p<.001). In the next step, this study calculated a main-effects model by adding the independent variables job anxiety, job depression and self-efficacy. These model is again significant (whole dataset: R²=0.12, p<0.001; Self-employed: R²=0.11, p<0.001; Employees: R²=0.14, p<0.001). In the third step, this study added the interactions between self-efficacy and (a) job anxiety, and (b) job depression. The model was significant by R² increased 0.1 (whole dataset: R²=0.13, p<.001; Self-employed: R²=0.12, p<0.001; Employees: R²=0.14, p<0.001). Thus, it is believed that both the direct effect and moderating effect contribute to the model establishment.

Table 24 Hierarchy regressions on Job Satisfaction

	whole dataset				self-employed			employees			
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	
Age	0.01 ***	0.01 ***	0.01 ***	0.01	***	0.01 **	0.003	0.003	0.01 ***	0.01 ***	0.01 ***
Gender	0.23 ***	0.23 ***	0.23 ***	0.19	***	0.23 ***	0.21 ***	0.21 ***	0.21 ***	0.26 ***	0.26 ***
Education	0.03 **	0.04 ***	0.04 ***	0.03	***	0.04 **	0.04 **	0.04 **	0.01	0.02	0.02
Income	0.02	0.03 .	0.04 *	0.06	***	0.08 ***	0.07 ***	0.07 ***	0.07 *	0.02	0.02
The self-employed		0.27 ***	0.27 ***	0.26	***						
job anxiety		-0.05 ***	-0.07	-0.05			-0.06 **	0.05		-0.08 ***	0.25 ***
job depression		-0.28 ***	-0.16 **	-0.17	**		-0.23 ***	-0.39 ***		-0.29 ***	-0.11
Self-efficacy		0.03 ***	0.03 ***	0.04	**		0.03 ***	0.04 **		0.03 ***	0.03 *
Job Anxiety*Self-Efficacy			-0					-0.01			-0.13 *
Job Depression*Self-Efficacy			-0.01 **					-0.01 *			-0.02 *
Job Anxiety *Self-employed				-0.01							
Job Depression *Self-employed				-0.06	*						
Self-Efficacy * Self-employed				0.01							
<i>R</i> ²	0.02	0.12	0.13	0.12	0.02	0.11	0.12	0.03	0.14	0.14	
F	17.83	66.16	55.41	145.6	9.33	29.51	23.44	13.62	39.09	31.31	
<i>P</i> -value	0	0	0	0	0	0	0	0	0	0	0

*** p<.001; ** p<.01; * p<.05

4.5 conclusions and implications

4.5.1 Conclusions

In general, the results indicate that self-employment is a career that generates higher job satisfaction than employees. Moreover, the study tested the relationship between the work-related stress and job satisfaction and found the negative relationship is significant existed. In addition, when it is compared with employees, the relationship between job depression and job satisfaction is weaker. In this paper based on POB perspective, the results verified that the self-efficacy moderate the relationship between work-related stress and job satisfaction as one of their effective and regulatory coping behaviours. This means effective coping with work-related stress can enhance the job satisfaction of the self-employed. Moreover, the interaction term of job depression*self-efficacy has a weaker impact on job satisfaction in the self-employed group as well. The model is supported by analysing a large sample from the Understanding Society, which representative of the population in the UK.

4.5.2 Implications

Theoretical implication

Theoretical implication

Firstly, this study involved the POB perspectives into entrepreneurship in studying how self-efficacy as positivity strength to enhance positive job feelings (job satisfaction) of the self-employed. Moreover, entrepreneurship theory so far provides little insight into

how the self-employed can use coping behaviours to regulate work-related stress. While previous studies have focused on the investigation of positive experience as ‘off-setting’ motivating factors (e.g., Baron, 2008; Cardon et al., 2005, 2009) to explain why individuals has higher workplace wellbeing, this study offers a novel and complementary perspective by proposing self-efficacy as coping behaviors on the negative relationship between work-related stress and job satisfaction. Our result verifies the direct effect of self-efficacy on coping stress and the moderating effect on the relationship between work-related stress and job satisfaction.

Secondly, while role differences between employment and self-employment are well established in the literature (Hoang and Gimeno, 2009; Shepherd and Haynie, 2009), there is insufficient theory linking these role differences, especially on the relationships among the factors associated with the job wellbeing. This is surprising given that the role of self-employment often involves dealing with tasks that are highly uncertain (McGrath and MacMillan, 2000), dynamic (Hmieleski and Ensley, 2007), and complex (Hoang and Gimeno, 2009) — tasks that are associated with the generation of considerable amount of stress (Boyd and Gumpert, 1983), but actually, they have higher job satisfaction and higher self-efficacy, compared to their wage-paid counterparts.

Thirdly, this study use matching approach to updating the dataset. By applying this approach to controlling for the demographic differences among groups, it can account for the group differences more appropriately.

Practical implications

This study has practical implications. At first sight, self-employment appears to be a career choice that has a significant higher job satisfaction. However, care must be taken with this interpretation because self-selection into an entrepreneurial career and selection out of this career may motivate only those with relatively high levels of self-efficacy. Given these preconditions, however, the self-efficacy provides individuals with various opportunities to use coping tools more effectively than employees to cope work-related stress and enhance job satisfaction.

These findings also offer some insights for leaders and managers in a corporate context. Since stress and negative emotions experienced by employees diminish their work motivation and performance, effectively dealing with and reducing employees' stress at work is an important issue for many firms (e.g., McCune, 1997). While develop employees' self-efficacy is an achievable and effective tool to cope their stress and negative emotions. Previous research also provides suggestions on how to develop self-efficacy and leaders and managers may take the reference from that.

4.6 Limitations and Implications for the future research

Future research can depart from the limitations of our study. One limitation is that we chose to use an existing, large and representative data set at the expense of drawing on more sophisticated measures for some variables, specifically work-related stress and outcome of recovery from negative emotions. Although the checklist approach that our data are based on is frequently used in coping research, more recently other methodological approaches (e.g., narrative approaches) have been developed (Folkman

and Moskowitz, 2004) that can provide a more detailed picture of coping behaviours of the self-employed. These studies, however, will likely be based on smaller and less representative samples than our work.

A second limitation is the data used in this study can only show the cross-sectional data. Applying the panel dataset in the future would benefit from observing the changes that work-related stress and job satisfaction.

Thirdly, by applying matching approach, it can be ensured the companioning group has the similar demographic background. However, this cannot distinguish between alternative ‘career mechanisms’ that explain such a finding. For example, self-selection into self-employment may motivate only those who are most capable of dealing with higher work-related stress to pursue and persist with self-employment over time. In knowing and anticipating the emotional challenges of their future occupational role (Begley, 1995; Hoang and Gimeno, 2009; Shane et al., 2003) only those individuals who believe that they can work long hours, are stress resistant may transition into self-employment. This suggests a positive correlation between self-employment and experiencing less work-related stress. With the data limitations, this study is not able to address this issue and must leave its investigation for future research.

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CHAPTER 5 CONCLUSION

5.1 Conclusion

5.1.1 Brief of chapters

The aim of this thesis is investigating the relationship between self-employment and workplace wellbeing and making comparisons with regular employees. Workplace wellbeing among self-employed individuals is a research area that is significant, yet remains inadequately investigated. Improvement of workplace wellbeing among the self-employed can be a resource for entrepreneurial behaviour and can contribute to better preconditions for these individuals' work and life quality. The thesis examines issues around self-employment and workplace wellbeing, including 1) The differences of workplace wellbeing between the self-employed and employees; 2) Factors that contribute to the workplace wellbeing 3) Relationship between the positive and negative workplace wellbeing. These questions and more specific issues were answered and discussed by conducting three empirical studies respectively.

The first study *'Does Autonomy Exert Magic Power On The Low-paid Self-employed's Job Wellbeing: The Moderating Effect of Low-Income level'* addresses the question of the differences of workplace wellbeing between the self-employed and employees. Moreover, this study explores the impact of job autonomy on workplace wellbeing. By taking the research scope of impoverished self-employment, this study also tests whether poverty constrains this relationship. To

address the questions, this study combines the Self-determination theory and Maslow's Hierarchy of needs theory

Based on Job-Demand-Control-Support Model, the second empirical study *Do the self-employed experience lower work-related stress? JDCS model test with matching approach* aims to understand the causes of negative workplace wellbeing of the self-employed by comparing with wage-paid employees. Moreover, the comparison analysis was also conducted between two kinds of the self-employed, the self-employed with hiring employees and the solo self-employed.

By drawing the recently emerging field of organisation studies, the positive organisational behaviour, or simply POB, which attempts to give a renewed emphasis to the importance of the positivity in the workplace. The third paper *Working related stress and job satisfaction of the self-employed: coping effect of self-efficacy* emphasised that the job satisfaction and self-efficacy are the essential elements of organisational positivity in self-employment. Moreover, the results suggested that self-efficacy is a significant factor of the coping mechanism to enhance job satisfaction and to reduce work-related stress.

These arguments were tested by using the samples selected from 'Understanding Society', the largest UK household panel dataset. The sample size of the first paper is 20626 observed individuals (self-employed: n=2682; Employees: n=17944), the sample of the second paper consisted of 3,743 individuals (employees: n=1,972; solo

self-employed: n=1,423; self-employed hiring employees: n=348)). The sample of the third paper consisted of 12162 individuals (Employees: n=10481; self-employed: n=1681). By applying the statistical method includes PSM, SEM and moderating hierarchy regressions, three main findings are summarised below to respond the above arguments established in the three empirical studies.

Firstly, to answer the question whether or not the self-employed experience higher job wellbeing than employees, several pre-conditions need to be taken into consideration. These pre-conditions include whether the individual's income is below the poverty line or not, which dimension of job wellbeing is discussed and what kind of the self-employment is studied. By conducting the comparative analysis, the results indicated that the self-employed experience higher job wellbeing than employees no matter the subjects are in the poverty condition or not. Regarding positive workplace wellbeing, the self-employed always experience higher job satisfaction than employees. However, regarding negative workplace wellbeing(work-related stress), the answer is complicated depending on the category of the self-employed. More specifically, the self-employed with hiring employees had a significantly higher level of work-related stress than employees. However, the solo self-employed experience significantly lowers work-related stress levels than employees.

Secondly, this thesis explores the factors that contribute to workplace wellbeing among the self-employed and employees. From the first study, the results indicate that job autonomy as a distinctive character of the self-employed exerts a significant impact on

workplace wellbeing. Moreover, this effect cannot be restrained by poverty in the self-employed group. However, in the employee's group, the poverty can moderate this effect. When the employees are under the poverty conditions, the impact of job autonomy on workplace wellbeing is reduced significantly. Moreover, based on JDCS model, results of the second study indicated that the job demands, job control and social support can directly cause of rising negative work-place wellbeing significantly. In addition, social supports also have moderate impact on the relationship between job demand and negative work-place wellbeing.

Thirdly, the relationship between negative wellbeing and positive wellbeing was verified in the third paper as negative, which means the increased work-related stress can reduce job satisfaction of individuals. However, this relationship can be moderated by self-efficacy, as a vibrant tool for the self-employed to adjust and digest high stress and enhance their job satisfaction, which also partly explains why the self-employed may experience a high level of work-related stress as well as high level of job satisfaction.

The summary of main findings from the three empirical studies are presented in the below table

Table 25 Summary of Main Findings

Questions	Data	Theory	Method	Result
Empirical study 1				
Do the self-employed always experiencing high job wellbeing than employees when they receive low pay	4 th Wave, N=20626 .	SDT and Maslow's Hierarchy of Needs	PSM, CFA and SEM	Yes
Do income levels exert moderating effect on the relationship between job autonomy and job wellbeing				Only in the employee's group
Empirical study 2				
How's work-related stress be different among employees, solo self-employed and self-employed with hiring employees	A merged dataset of Waves 5 and 6. N=3743	Job Demand Control Support Model	PSM and moderating hierarchy	The self-employed with hiring employees had a significantly higher level of job depression than employees. However, the solo self-employed experience significantly lower work-related stress levels
How job demands, job control, and social support affect the work-related stress among three occupation groups.				Job demands, job control have a direct effect on work-related stress within the self-employed. Social support has direct and indirect impact within solo self-employed group only.
Empirical study 3				
Does self-employed has a higher level of job satisfaction than employees?	A merged dataset of Waves 5 and 6. N=12162	Positive Organisational Behavior	PSM and moderating hierarchy	Yes
What's the relationship between work-related stress and job satisfaction?				Negative
Does self-efficacy can effectively moderate the relationship between stress and job satisfaction				Yes, weaker in the self-employed group

5.2 Contributions

5.2.1 Theoretical contributions

Firstly, by discussing the issue of self-employment and workplace wellbeing, the present research expands the definition of ‘entrepreneurial success’ by including workplace wellbeing. In the past, such success has been measured primarily in terms of financial aspects; yet it is becoming clear that such outcomes are only one of the many goals sought by the self-employed (Rindova et al., 2009).

The main theoretical contribution of this thesis is involving several significant psychological theories to the entrepreneurship research field. The majority of psychological theories focus on the individual level study. When they are introduced to entrepreneurship field, the combinations may bring new insights, even exposing the new question, new topic and a new field that has not been discussed before, and in fact, which are essential to entrepreneurship studies at the individual level. The theme of wellbeing at workplace among the self-employed is an emerging topic of entrepreneurship, which has been addressed by researchers recently (Uy, Foo and Song, 2013; Wiklund et al., 2016; Felstead, Gallie and Green, 2015). When this topic has been looked at the individual level, the personal psychological factors cannot be excluded from considerations. The psychological theories used in this thesis include Self-determination theory, Maslow’s hierarchy of need theory, Job Demand-control-support model and Positive Organisation Behaviour. With the help of

these theories, this thesis builds new knowledge of various intra-personal factors within the theoretical framework (include job autonomy, poverty, job demand, job control, social support and self-efficacy) and their impacts both directly and indirectly on the workplace wellbeing among the self-employed.

Simultaneously, the combination of psychological theories with entrepreneurial empirical evidence in this thesis not only offers the new knowledge to the field of entrepreneurship but also sheds some light to the psychological theories development. For example, the first study considers the interplay of SDT theory and Maslow's Hierarchy of needs theory to test the universal validity of the SDT theory, by involving a moderator-the poverty. Consequently, it has been verified that poverty cannot constrain the impact of job autonomy on job wellbeing within the self-employed group but has effect in employees group, which re-define the universal validity of autonomy within the SDT theory.

In the second study 'Do the self-employed experience lower work-related stress? JDCS model test with matching approach', the Job-Demand-Control-Supports model (JDCS) is employed to underpin the study. In the past, the buffering hypothesis on social support's moderating effect within JDCS has been almost defined as a 'zombie theory' which should long ago have died from a lack of empirical evidence (Taris, 2006). However, in this thesis, this hypothesis has been verified by using self-employment evidence.

The third study, ‘working related stress and job satisfaction of the self-employed: coping effect of self-efficacy’ focused on the coping mechanism of self-employed individuals in entrepreneurship, which emphasises on reducing negative workplace wellbeing and enhancing the positive workplace wellbeing. In this chapter, the study is conducted based on the positive organisational behaviour perspective, which is a field that has emerged recently from the proposed positive psychology approach and still under the development. All the new evidence from empirical studies, including the evidence from entrepreneurship research field, will help to develop the POB theories.

5.2.2 Methodological contributions

The major contributions in terms of methodology lay on employing the matching approach in the comparative analysis between the self-employed and employees with large samples. This method has been used across the three empirical studies of this thesis. Because the self-employed is a very heterogeneous group and very different from regular wage-paid employees, and due to a lack of a causal connection between the control variables, the methodological difficulty in eliminating selection bias has been identified as a considerable problem by previous research (Caliendo and Kopeinig, 2008). By applying the matching procedure in all three studies of the thesis, the problem of selection bias is largely solved and verified the arguments with greater robustness. This method have achieved this by (i) enabling data balancing thus reducing or removing the confounding effect of a covariate, and (ii) gaining greater precision by

allowing an estimation of a narrower confidence interval around the effect measure that could not have been obtained without matching (Guo and Fraser, 2010; Joffe and Rosenbaum, 1999; Rosenbaum and Rubin, 1985). Matching approach is helpful and very useful for the comparative study with big data, particularly, when it combines with other statistical analysis, which is difficult to measure and control the selection bias. For example, in chapter 2, the matching approach is employed with SEM, which helps to simplify the complex process of controlling demographic variables in the modelling test.

5.2.3 Empirical contributions

In addition to these theoretical and methodological contributions, the present findings also offer ones of a more practical nature. Firstly, addressing to the self-employed and the individual who is interested in becoming self-employed, the results of this thesis provide insights into their workplace wellbeing conditions, which is significantly higher than the wage-paid employees. It is believed that the workplace wellbeing is a vital non-financial element of entrepreneurial motivation and a non-financial self-employment reward, which should be taken into consideration when a person plans his/her career life. Secondly, for the self-employed, the present results suggest that one skill the self-employed should seek to acquire is the capacity to cope with and manage stress effectively. Fortunately, many effective techniques for achieving these goals exist (Lehrer, Woolfolk, and Sime, 2007). For example, results of this thesis show that

job demand, job control and social support are highly related to workplace wellbeing. Thus, balancing the work and personal life and remain a sound relationship with family and friends would be helpful to strengthen the workplace wellbeing. In addition, in this thesis, self-efficacy is highlighted as one of the effective techniques and a valuable personal asset for the self-employed to enhance workplace wellbeing. Thus, steps, including self-training, external training or learning from cumulated experience to help improve the self-efficacy of the self-employed, may also be proven valuable (Luthans et al., 2007).

For policymakers, as noted before, workplace wellbeing as one of ‘entrepreneurial success’ and motivations, may imply the policymaker to consider the non-financial impact of self-employment to the society as evidence to highlight the significance of self-employment. Moreover, a key goal of the field of entrepreneurship is to assist entrepreneurs in their efforts to convert their ideas and vision into reality—viable products or services. Thus, for the government, helping those self-employed to enhance skills like the self-efficacy and offering the external social support that can assist them to improve their workplace wellbeing may potentially help them to achieve the other sides of entrepreneurial success as well (Baron, 2012).

5.3 Future directions of research

There appear to be some other opportunities for research that might build upon what has been done here. Firstly, the relationship between workplace wellbeing and

subsequent commitment seems significant. For example, do the self-employed with high levels of workplace wellbeing subsequently commit more heavily to their businesses? Does their workplace wellbeing translate into more effective interaction with employees and customers? Moreover, it seems likely that, at different stages, the significance of workplace wellbeing would be viewed differently. It may be because, with the experience cumulated, the self-employed may define the entrepreneur's success with different emphasises, however, this has not been explored thoroughly due to the limitations of cross-sectional data employed in this thesis. These questions may be able to answer in the future research.

Secondly, the present findings help to link widely accepted psychological theories to answer the important questions in the field of entrepreneurship. Forging such interdisciplinary connections between the field of entrepreneurship and other fields has long been viewed as an important and desirable goal (Baron, 2002). For future research, it will be highly desirable to see more and more interdisciplinary connections emerge and shed light with new findings.

Moreover, the comparison analyses have been conducted across the three empirical studies of the thesis. It not only presents the differences between the self-employed and employees but also presents the differences among the self-employed from different income levels, with different labour recruitment status. Also, workplace wellbeing and work-related stress were measured and classified into various aspects. Consequently,

results were different depending on these classifications of occupation, recruitment status, income levels, job wellbeing and work-related stress, which may imply in future research the value and significance of measurements employed in the research and extend to other diversion approach to study self-employment and workplace wellbeing, for example, comparing the differences between necessity-based self-employment and opportunity-based self-employment.

Lastly, with the increased call for big data analysis and research on ‘impact’, matching approach will be an appropriate and useful tool to the employee to deal with the large dataset in comparison studies. However, even though this method has been developed for 40 years, it is not known and applied widely in social science, especially in entrepreneurship field. Also, most of the paper applied this method alone for the comparison purpose, by giving the example of the second empirical study, it can be believed that the potential of combining the matching approach with other statistical method is large and need to be explored in the future. Moreover, further research might fruitfully centre on extending our findings from the Understanding Society data set to other countries as well as extending the analysis to over longer horizons to explore the longer term causal effects of self-employment on workplace wellbeing.(Hamilton, 2000).

5.4 Limitations

It should be recognised that there are differences in the initial measure of factors like job demand, job control, social support, self-efficacy and the later measure of the workplace wellbeing. In this thesis, one limitation is that we choose to use an existing, large and representative data set at the expense of drawing on more sophisticated measures for these variables. Although the checklist approach that our data are based on is frequently used, more recently, other methodological approaches (e.g., narrative approaches) have been developed (Folkman and Moskowitz, 2004) that can provide a more detailed picture of coping behaviours of the self-employed. These studies, however, will likely be based on smaller and less representative samples or the qualitative research than the work of this thesis. Thus, there appear to be opportunities for future research involving more explicit measures of the relevant factors and subsequent workplace wellbeing. The other one of commonly mentioned problems in this kind of research is insights on causality and the drawbacks of using self-reports, for example, the reference bias, which occurs when different standards of comparison influence survey responses.

The second limitation is that as the self-employment is a complicated progress, the cross-sectional data cannot provide the full information to reflect this progress and its relationship with workplace wellbeing. The primary limitation of cross-sectional research design is that the exposure and outcome are simultaneously assessed, there is no evidence of a temporal relationship between exposure and outcome. Without

longitudinal data, it is not possible to establish an exact cause and effect relationship. Thus it would be better if a panel sample can be applied to investigate the stress raising and coping process of workplace wellbeing. Moreover the Understanding Society is the largest household panel dataset in the UK, unfortunately, because data for some specific variables are only available in certain waves, this thesis is unable to conduct panel analysis. With the continued wave releasing in the future, the potential of this dataset to do panel analysis on the relevant topic of workplace wellbeing and self-employment need to be maximally explored and realised.

The final limitation is that this thesis only reveals a partial image of the workplace wellbeing and self-employment. The whole picture is far larger to explore. Workplace wellbeing and self-employment is a dynamic and complex process and topic, it should be noted that this study has primarily been concerned with testing hypothesised relationships between certain variables and workplace wellbeing. It has not sought to develop a model of all major variables influencing the workplace wellbeing. Future research might include other variables, such as those bearing upon opportunity costs for the individual self-employed as well as measures of environmental hostility. Thus the models presented could be further developed and tested. A comprehensive and detailed analysis of a more complicated model and particularly paying attention to causality is called for the future studies.

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