An analysis of the effect of temporary/permanent contracts on firm efficiency performance: Evidence from South Korea

Abstract

Methodology

Using a sample of Korean listed firms (2010-2015), pooled OLS regression analysis is conducted to show whether firms that offer employees higher levels of permanent, relative to temporary contacts demonstrate higher firm performance/efficiency.

Purpose

Because no international accounting policy exists to mandate human capital (HC) information must be reported on financial reports, the association between workforce HC and firm performance/efficiency is not well-established. South Korea is a rare example with high HC reporting quality, as well as relatively high national productivity. On the other hand, in some developed countries (such as the UK), HC reporting quality and productivity is low. Moreover, there is an increasing propensity to offer employees non-standard contracts. Thus, because of a divergence in HC reporting quality internationally, the South Korean sample can provide valuable insights to countries with weak HC reporting quality about the association between contract quality and firm performance/efficiency.

Findings

Firms that provide employees with increasing permanent (temporary) contracts experience higher (lower) performance/efficiency.

Originality/value

Because of data unavailability, a positive association firm-level performance/efficiency and permanent employment can only be made in a handful of countries. The study has policy implications and extends the non-financial reporting literature by addressing HC reporting limitations that exist in the mainstream accounting framework. Based on relative operational efficiency/performance, the study offers practical insights to management about the importance of staff retainment. Moreover, we also offer an anthropocentric perspective by inferring how low HC reporting quality can have a negative impact on society in Industry 4.0.

Keywords: annual reports; human capital; legitimacy theory; productivity; accounting policy; employee rights

1. Introduction

It is widely reported in the Human Resource Management and Industrial Relations literature that human capital (HC) is a firm's most valuable asset (Curado et al., 2011; Guthrie et al., 2012; Guthrie and Petty, 2000; Johanson, 2001; Mouritsen et al., 2001; Sveiby, 1997). However, in the accounting literature, there is no consensus on the best approach to report HC on financial reports. Historically, there have been arguments that HC should be directly recorded on Annual Reports as an asset or equity (Hermanson, 1964; Hekimian and Jones 1967; Flamholtz, 1974; Wall et al., 2003). However, Flamholtz (1975) surmises that recording HC as a numerical value on Annual Reports is a flawed concept because assets require ownership rights by definition. As a result, no accounting policy exits to mandate firms report HC information on Annual

Reports. Thus, in the extant literature, studies using large datasets to associate HC and firm performance/efficiency are limited.

Recently, there has been increased pressure on the accounting profession to enhance HC reporting quality to provide employee information on a comparable, structured and consistent basis (Bassi et al., 2015; Fincham and Roslender, 2003; McCracken et al., 2018; Roslender et al., 2012). However, as of this date, there is a knowledge gap regarding the type of information that would be useful to stakeholders. There are differing view regarding; i) the arguments put forward by some in the accounting profession, inferring HC information should be presented as a numerical value on financial statements; ii) arguments put forward in Industrial Relation's literature, inferring the ability, skills and the knowledge of a firm's workforce adds value to business operations (Becker, 1975; Fitz-Enz, 2009); and iii) anthropocentric perspectives that infer firms have a responsibility to report HC information as an ethical consideration (Lim and Mali, 2021). Because of the conflicting views of stakeholders, as of this date, HC reporting is unstructured an opaque.

Because of a lack of regulatory oversight, management have discretion regarding the level of HC information made available to the public on financial reports. Based on legitimacy theory, firms that provide HC information, over and above expected levels can be considered as aligning their business strategies with the expectations of society (Guthrie et al., 2004; 2006). On the other hand, management can choose to only disclose positive HC information as an image management strategy (Abeysekera and Guthrie, 2004, 2005; Tinker, 1980; Tinker and Neimark, 1987). Thus, because firms can choose (not) to disclose HC on Annual Reports, academic tension exists regarding how HC influences firm performance/efficiency. This study therefore has several motivations.

First, it is widely acknowledged that human/intellectual capital information provided on the Annual Report (Dumay, 2016; Gowthorpe, 2009), Corporate Social Responsibility Report (Brennan et al., 2013; Cho et al., 2012) and Integrated Report (De Villiers and Sharma, 2020; Flower, 2015; Menicucci, 2018) is limited. To address this caveat, the non-financial reporting (NFR) literature demonstrates how information that is excluded from the mainstream accounting framework can be informative to stakeholders (Baboukardos, 2017; Baboukardos and Rimmel, 2016; Jackson et al., 2019; La Tore et al., 2018). Whilst NFR HC information is rare internationally, South Korean Annual Reports include unique NFR HC information such as temporary/permanent contract information (Lim and Mali, 2021) following government interventions (Hundt, 2015; Kim, 2010; Kim and Rowley, 2006; Lee, 2005; Lee, 2015) and an impetus to enhance financial reporting quality (Choi et al., 2017; Mali and Lim, 2018, 2020i,ii). This study is therefore motivated to extend the NFR literature by providing evidence that structured, firm-year, NFR HC information that is excluded from the accounting framework (currently available in South Korea, but not internationally) can be informative to market participants.

Second, the main research question of this study is: *Do firms with higher a higher ratio of permanent (relative to temporary) contracts demonstrate higher levels of efficiency performance?* To the best of our knowledge, this is the first study to associate HC and operational/relative efficiency. This study is unique because relative firm efficiency is estimated using Data Envelopment Analysis. More specifically, the optimal revenue a firm can achieve, using (excluding) inputs that are (not) available to management to generate sales. In the productivity literature, there is increasing evidence that relative efficiency is a robust measure of operational firm performance, because compared to simple accounting ratios, it is less susceptible to bias, and more

reflective of business operations (Baik et al., 2013; Dermajian et al., 2012; Frijns et al., 2011; Mali and Lim, 2021). Thus, by using relative efficiency as a firm performance variable, the study can provide valuable insights to management about the effect of HC, contract quality and workforce management on operational business performance/efficiency.

Third, HC information is required by labour unions for collective bargaining (Americ, 1985; Blackett and Sheppard, 2003; Bosch, 2015; Craft, 1981; Gernigon et al., 2000; Hui, 2014; Maunders and Foley, 1984; Mautz, 1990; Shen et al., 2008; William et al., 2020). Moreover, socially responsible investors require HC information to base investment decisions (Beal and Goyen 1998; Berry and Junkus, 2013; McLachan and Gardner 2004; Nilsson 2008; Rosen et al., 1991). However, in the vast majority of countries, based on current financial reporting requirements, HC is not reported on a structured basis. We are therefore motivated to provide a normative perspective and policy suggestions about the necessity to integrate a more robust HC framework into the mainstream accounting framework.

Fourth, anthropocentric perspectives are limited in the efficiency/productivity literature (David, 2016). It is widely reported that Industry 4.0 will result in higher firm efficiency, however, unemployment will also increase (Stojanova et al., 2019; Bonekamp et al., 2015). Thus, the study is motivated to explain how opaque HC reporting quality can have a detrimental effect on society in Industry 4.0. Fifth, by means of a comparative case-study approach, we are also motivated to show how low HC reporting quality can be detrimental to an economy. The UK is considered a relevant case study because; i) UK legislators recognize the 'productivity problem'. ii) The UK has low HC reporting quality (Bassi et al., 2015; Fincham and Roslender, 2003; Li et al., 2008; Lim and Mali 2021; Striukova et al., 2008; Roslender and Stevenson, 2009; Vandemaele, et

al., 2005). iii) Legislators have attempted to mandate higher levels of HC reporting quality (DTI 2001; CIPD, 2017), but this has not been accepted by firms. iv) UK firms have an increasing propensity to offer low quality contracts (Farina et al., 2020; Koumenta and Williams, 2019). Therefore, because GDP and firm performance are linked, using a South Korea/UK comparative analysis basis, the UK can be used as case study to explain how low HC quality can be detrimental to an economy.

The paper proceeds as follows. In section 2, relevant literature will be reviewed, and the hypothesis will be developed. The research design will be introduced in section 3. Section 4 will provide the results of the main analysis. In section 5, additional analysis will be conducted. Section 6 concludes.

2. Literature Review and Hypothesis Development

2.1. Literature review

As a result of technological advances, Industry 4.0 will change business operations forever. Many repetitive tasks conducted by humans will be replaced by artificial intelligence (AI) and deep learning systems (Terziyan et al., 2018). It is also widely accepted that in Industry 4.0, the relationship between humans and new technologies will revolutionize production systems in an equivalent manner to the industrial revolution in the 19th century. At present, the literature reports that three different types of relationships have the potential to exist between employees and new technologies: a) AI can be used in fully autonomous systems; b) AI can be utilised, but being dependent on human inputs, or; c) a shared control relationship based on the close interaction between humans and IT systems (Wang et al., 2015). Increasingly, the literature reports that a close relationship between AI technology and employees is

likely to be the most effective and common relationship. Therefore, in the current industrial climate, there is increasing impetus to nurture HC in preparation for the adoption of Industry 4.0.

Stojanova et al. (2019) report that there will be a significantly higher level of unemployment in the 55 to 65 age group in the next ten years. Bonekamp et al. (2015) report that there will be new employment opportunities for high-skilled workers; however, there will be increasing levels of unemployment for low-skilled employees (Stojanova et al., 2019). Therefore, Industry 4.0 can be considered from both a i) productivity/efficiency and ii) an anthropocentric perspective. At present, very few studies report an anthropocentric perspective. David (2016) surmises that the productivity benefits of Industry 4.0 should not come at the expense of human factors. However, the majority of studies associate Industry 4.0 with efficiency benefits. From a purely economic perspective, firms have two options to improve efficiency. Firms can increase outputs by generating higher sales (Technical efficiency) or by decreasing inputs such as salary expenses (Production efficiency). Of the two, decreasing inputs can be considered the easier short-term option, because it does not require strategic planning (Lim and Mali 2019). Industry 4.0 is based on the premise that investing in IT systems will reduce various unnecessary operational expenses to increase production efficiency. However, salary expense and other staff investments can be considered by management as operational expenses that can also be reduced to enhance efficiency (Merino, 1993; Stovall and Neill, 2017). Therefore, it can be surmised that as a result of Industry 4.0; i) new IT systems will lead to increased efficiency, and ii) there will be job losses because of new technologies. However, surprisingly the direct association between workforce HC and firm efficiency is not widely reported in the extant literature.

The reason the relationship between HC and firm efficiency is rarely reported in the literature is that no financial reporting policy exists to mandate that firms must report HC on financial reports on a structured basis. In this study, it is inferred that firm temporary/permanent contract terms can be considered a parsimonious and felicitous proxy of HC and associated with firm performance/efficiency. However, only in a handful of countries such as South Korea, firm-level contract information is disclosed on a transparent basis. Therefore, HC reporting framework limitations are discussed. Of the three main financial reports, the Annual Report is considered the primary document by information users (Dumay, 2016). There have been numerous attempts to develop models to report HC on Annual Reports (Hermanson, 1964; Hekimian and Jones, 1967; Flamholtz, 1974; Wall et al., 2003). However, allocating an asset/equity value for employees has been criticised because employees are not physically owned by firms, as defined by a traditional asset (Flamholtz, 1975). Thus, whilst there have been arguments that providing structured disclosures about HC on Annual Reports can enhance information quality (Gowthorpe, 2009), in the vast majoirty of countries, employee level data is reported on an unstructured basis on Annual Reports.

Second, to overcome the limitations associated with HC reporting in the Annual Report, the Corporate Social Report adopts a business sustainability approach. The Corporate Social Responsibility Report offers information about HC ethics for benchmarking purposes (Leung and Gray, 2016). However, whilst Corporate Social Responsibility Reports provide valuable information to make business sustainability inferences, comparable numerical information is not presented on Corporate Social Responsibility Reports (Brennan et al., 2013). Thus, they are criticised as being a public relations management tool (Cho et al., 2012). Third, the Integrated Report is considered as a breakthrough in intellectual capital reporting (De Villiers and Sharma, 2020).

Dumay et al. (2016) argue that the Integrated Report has the potential to be used by market participants to explain the association between HC and firm performance. However, the level of Integrated Reporting participation is lower than expected (De Villiers and Sharma, 2020). Others argue that Integrated Reporting has lost impetus, and is subject to regulatory capture (Flower, 2015; Menicucci, 2018). Taken together, the literature infers that whilst HC information is demanded by market participants, the financial reporting framework has limitations.

Non-financial reporting (NFR) refers to information that is excluded from the mainstream accounting framework but can be informative to stakeholders (La Tore et al., 2018). Jackson et al. (2019) surmise that NFR information is increasingly being demanded by information users for three reasons. First, in the absence of structured and transparent information, NFR can be considered a mechanism by which business ethics can be evaluated by market participants. There is increasing evidence that NFR information can be an indicator of good business practice (Baboukardos, 2017; Baboukardos and Rimmel, 2016). Second, as inferred by KPMG (2016), NFR information is increasingly being used by legislators to inform policymaking. Third, there is evidence that NFR information can be utilized by market participants as an indicator of firm value/performance (Jackson et al., 2019). Given the increasing importance of NFR for stakeholders, the literature can be extended with studies that provide empirical evidence that NFR HC information, that is excluded from the financial framework, can have an intervening effect on firm performance/efficiency.

South Korea is a unique dataset where HC NFR information is reported on Annual Reports as a rule. Therefore, the effect of workforce/employee level HC and firm performance/efficiency can be explicitly made in South Korea. It is not possible in the vast majority of other countries. The literature provides two reasons why South Korean

firms offer transparent HC information on Annual Reports. First, due to limited natural resources on the Korean peninsula, following the Korean War, South Korea's national productivity strategy has been based on developing human resources (Hundt, 2015; Kim, 2010; Kim and Rowley, 2006; Lee, 2005; Lee, 2015). Thus, legislators mandate that HC information must be reported on Annual Reports. Second, South Korea is shown to be an early-adopter of various accounting policies to enhance transparency and to increase public confidence in the accounting profession (Choi et al., 2017; Mali and Lim, 2018, 2020i,ii). Thus, South Korea's policy to report transparent HC information can be considered a i) a national productivity strategy, and ii) a policy to enhance financial reporting quality.

HC reporting quality differs internationally based on financial reporting requirements (Belal, 2019; Diaz-Carrion et al., 2019; Jamali, 2015; Nia, 2018). Given that HC information is important for labour unions (Americ, 1985; Craft, 1981; Maunders and Foley, 1984; Mautz, 1990; William et al., 2020) and is becoming an increasingly important consideration for ethical investors (Beal and Goyen 1998; Berry and Junkus, 2013; McLachan and Gardner 2004; Nilsson 2008; Rosen et al. 1991), it is surprising HC reporting does not exist in the mainstream accounting framework. Because there is no international requirement for firms to report HC, management can select one of two options when making HC disclosures. First, legitimacy theory is the process by which firms demonstrate social responsible business practices to the public (Deegan, 2009; Henderson et al., 2004; Lindblom, 1993). Transparent HC information over and above expected requirements is considered a legitimacy strategy (Guthrie et al., 2004, 2006). Second, management can choose to disclose favourable HC information as an image management strategy (Abeysekera and Guthrie, 2004, 2006; Tinker, 1980; Tinker and Neimark, 1987). Therefore, given the differences that exist internationally, a study that

shows the strengths/weaknesses of HC reporting systems, and their effect using a competitive analysis approach, can provide valuable insights to legislators (Scraggs et al., 2013).

The UK is considered an informative comparison by means of a case-study approach, because it would not be possible to repeat this study in the UK. Therefore, the UK is used to demonstrate how low HC reporting quality has the potential to be detrimental to the economy, stakeholders and society. British firms have lower levels of HC reporting quality compared to developed countries (Bassi et al., 2015; Fincham and Roslender, 2003; Li et al., 2008; Striukova et al., 2008; Roslender and Stevenson, 2009; Vandemaele, et al., 2005). As a result, permanent/temporary contract information amongst many other forms of HC are not routinely reported in the UK. Furthermore, whilst South Korea was equivalent to a sub-Saharan country 60 years ago, South Korea currently has higher HC quality, compared to the UK (Lim and Mali, 2021). Critical scholars infer low HC reporting quality is a result of industrial relation policy failures, which has put shareholder wealth above employee welfare (Nolan, 1989; Metcalf, 1989; Nolan, 1994; Nolan, 2011). Other argue that the UK labour market has prioritised skills supply through the public education system (Lloyd and Payne 2016, Keep 2020). Regardless of which supposition is more likely, the British government has routinely attempted to intervene to enhance HC reporting quality (DTI 2001; CIPD, 2017). However, as of this date, they have been unsuccessful.

A phenomenon known as the 'productivity puzzle' is recognized as a crucial problem for the UK government. Therefore, a lack of firm-level HC information[1] can be considered a limitation for government decision making, because firm performance and

[1] Because of firm-level data unavailability in the UK, the Office of National Statistics (ONS) collects aggregated contract data using questionnaire data.

GDP is linked. Thus, a South Korean insight can be valuable to countries such as the UK and other countries with low productivity and HC reporting. HC investment such as training and skill development have the potential to improve individual, workforce and national productivity (Becker, 1975). Fitz-Enz (2009) reports that HC is increasingly being considered important by the British government and legislators in productivity debates. However, in the UK, there is an increasing pivot to provide employees with zero hour / non-standard contracts (Farina et al., 2020; Koumenta and Williams, 2019; Rubery et al., 2016; Wood, 2016). Thus, as a basis for comparison, the UK can be interpreted as having i) low HC reporting quality, ii) a government that attempted to intervene in enhancing HC reporting quality, iii) a productivity problem, and iv) increasingly, lower quality contracts are provided to employees.

In this study, three theories are introduced to explain why providing higher levels of permanent contracts, relative to temporary contracts has the potential to enhance firm performance/efficiency. First, resource-based theory (RBT) implies that firms can be considered homogenous based on tangible assets. However, firms develop comparative advantages based on the heterogeneous skills of their employees (Goh, 2005; Grant, 1996; Mousavi et al., 2012; Li et al., 2020), including investment in employee training (Ballot et al., 2006). There is also evidence that temporary contracts diminish HC as a resource (Bishara and Orozco, 2012). Thus, from a purely economic perspective, reducing wage expenses can enhance firm efficiency / profitability. However, RBT infers that by investing in employees and providing permanent contracts, firms are likely to be more profitable.

Second, insecurity associated with temporary employment has a negative effect on physical health and wellbeing (Cheng and Chan 2008; De Cuyper, et al., 2009; Hopkins, 2017; Kim et al., 2017; Virtanen et al., 2008). Temporary employment is

associated with alcohol dependency (De Cuyper, et al., 2009). Furthermore, there is evidence that the motivation of temporary employees is lower compared to permanent employees (Millward and Brewerton, 2000). Whilst there is evidence that the job satisfaction of temporary workers is higher than permanent employees (Dawson et al., 2014), the literature suggests that temporary employment is likely to have negative effect on individual performance, hence firm performance.

Third, Hecklau et al. (2016) report that firm competitiveness is directly associated with terms of employment and employee involvement. There are several studies that surmise that a firm's ability to adapt to technological and business trends is associated with employee involvement (Kyndt and Baert, 2013). Employee engagement is associated with developing trust, organisational openness and leadership (Bedarkar and Pandita, 2014; Thomas et al., 2009). Tortorella et al. (2108) consider employee involvement to be a sense of belonging to an organisation through a high degree of commitment. They also posit that employee involvement empowers employees to enhance business operations. Mann (2009) suggests that employee involvement enhances employee satisfaction, which directly influences a firm's profitability and competitiveness. Kagermann et al. (2013) also surmise that including human involvement in operational decision making should be considered a business strategy, because it promotes social engagement. Employee involvement is also considered a key feature of developing the skills required to adapt to the changes in Industry 4.0 through employee training and skills (Benešová and Tupa, 2017; Buer et al., 2018; Tamás, et al., 2016; Schuh et al., 2015), which can be considered a key element of an organization's success. Thus, in Industry 4.0, providing employees with permanent contracts can be considered a direct strategy to encourage employee involvement, hence enhance firm performance.

2.2. Hypothesis development

There are two potential relationships between permanent (temporary) contracts and firm performance/efficiency. First, there is evidence that management consider reducing labour costs as a strategy to increase production efficiency (Merino, 1993; Stovall and Neill, 2017). In the UK, there is evidence that non-standard contracts are becoming the norm (Farina et al., 2020; Koumenta and Williams, 2019), which implies firms may consider that there is an economic benefit to offering lower quality (temporary) contracts to employees, as opposed to permanent contracts. The above would be captured as negative relationship between permanent employment levels and firm performance/efficiency.

Second, there is evidence that increasing temporary contracts reduces labour productivity (Diaz-Mayans and Sanchez, 2004; Rodríguez-Gutiérrez, 2007). Therefore, whilst there is a cost reduction associated with reducing contract quality, it can have an intervening negative effect on revenue generation. Based on this inference, we hypothesize that it is more likely a positive relationship will exist between permanent employee levels and firm performance/efficiency. To provide a conceptual framework for our hypothesis, four assertions are borrowed from the literature. I) compared to permanent employees, employees with temporary contracts are less likely to develop psychological traits such as loyalty, motivation or a sense of shared ownership (Kuvaas and Dysvik, 2011). II) RBT implies that firms are homogenous, but investment in employees can lead to heterogeneous employee skills that develop comparative advantages (Ballot et al., 2006; Bishara and Orozco, 2012; Goh, 2005; Grant, 1996; Mousavi et al., 2012; Li et al., 2020). Thus, by providing permanent contract terms and by investing in employees as a resource, employees are likely to add value.

III) temporary workers are likely to have lower mental health and physical health compared to permanent employees (Virtanen et al., 2008; Kim et al., 2017). IV) Moreover, the literature show that permanent employee involvement provides firms with various comparative advantages (Bedarkar and Pandita, 2014; Hecklau et al., 2016; Kyndt and Baert, 2013; Mann, 2009; Thomas et al., 2009; Tortorella et al., 2018). Based on the above, the following hypothesis is developed:

H.1. Firms that provide employees with permanent contracts are more likely to be profitable/efficient than firms that provide employees with temporary contracts.

3. Research Design

The dependent variable *Relative_perform* is estimated using a Data Envelopment (frontier) Analysis (DEA). The model is an extension of the models developed by Mali and Lim (2019) and Demerjian et al. (2012). In equation (1) relative firm performance/efficiency is estimated as sales divided by resources (*PPE, Operating Lease, Goodwill and Other Intangibles*) and expenses (*Cost of goods sold, SG&A, net property, plant, and equipment, net operating lease and purchased goodwill*) that are directly under the control of management to generate sales. There is increasing evidence that absolute accounting techniques such as ROA are less informative compared to relative efficiency measures (Baik et al., 2013; Dermajian et al., 2012; Frijns et al., 2011). For example, Mali and Lim (2021) provide evidence that relative efficiency is impounded into borrowing costs, whilst ROA does not have an intervening effect. To explain the computational superiority of relative performance/efficiency compared to absolute efficiency ratios (such as ROA), three issues are highlighted. First,

ROA's denominator, total assets is subject to various accounting treatments. Second, all assets are included into the ROA ratio, regardless of whether they are directly used to generate revenue or not. Third, ROA considers all asset/expense inputs to be equal for all industries. On the other hand, relative efficiency provides a unique optimal frontier of the most effective utilization of resources (from highest to lowest) for all inputs for separate industries. Thus, relative efficiency measure can be considered a felicitous variable to report the effect that providing permanent/temporary contracts can have on operational performance/efficiency.

$$max_u \theta = \frac{Sales}{u_1 GivenResources + u_2 Costs} \quad (1)$$

Where,

Output

Sales : Gross Sales

Input 1

Given Resources : PPE + Operating Lease + Goodwill + Other Intangibles

Input 2

Costs : Cost of goods sold + SG&A

PPE : net property, plant, and equipment

Operating lease : net operating lease

Goodwill : purchased goodwill

Relative firm performance/efficiency is estimated as follows. First, a Decision-Making Unit (DMU) is recognized at consolidated/listed firm level. Second, for each DMU, the denominator sales (output), and the resources that are directly under the control of management (input 1 and 2) in equation (1) are placed in a balanced panel by industry and year. Third, to discover the most effective utilization of resources at firm, industry and year level, a weighting structure is included. In equation (2), for all DMUs, sales is represented by O and given resources and costs are represented by P. Weightings for input and output values are denoted by u and v. These weightings produce a DEA vector in equation (2), which estimates an efficiency optimization

frontier of resource utilization for all firms per industry and year. Finally, the efficiency ratios/vectors for each industry and year are scaled based on the output of the most efficient firm so they are comparable on a 0-1 basis. For example, the most efficient mining firm can have an efficiency ratio of 3.4/3.4 =1. By comparison, a mid-level efficiency firm in the IT industry has the potential to have a ratio of 5/10=0.5. This procedure allows for a comprehensive analysis of relative performance.

$$\frac{\sum_{i=1}^{O} u_i y_{ik}}{\sum_{j=1}^{P} v_j x_{jk}} \quad k = 1, \dots, n. \qquad (2)$$

In equation (3), the cross-sectional OLS regression analysis model is listed. The main independent variable of interest, *Perment_emp* equals the ratio of permanent contracts to temporary contracts. As explained in the hypothesis, it is expected that firms that invest in their employees on a permanent basis are likely to have higher levels of performance/efficiency compared to firms that offer contracts to employees on a temporary basis.

$$Relative\_perform_{it} = \alpha + \beta_1 Perment\_emp_{it} + \beta_2 Size_{it} + \beta_3 Big4_{it} + \beta_4 Audit\_fee_{it} + \beta_5 Leverage_{it} + \beta_6 ROA_{it} + \beta_7 Big\_Own_{it} + \beta_8 Market\_share_{it} \qquad (3)$$

In Table 1, control variable estimation is reported. *Size* is estimated as the natural logarithm of total firm assets. Because smaller firms are likely to be growing at a faster rate compared to larger established firms, a negative association between relative performance and total assets is expected. *Big4* is a dummy variable that takes the value of 1 if a firm is audited by a Big4 audit firm, 0 otherwise. Big4 auditors are reported as being more conservative compared to Non-Big4 firms (Herrmann et al., 2008). Thus,

Big4 clients have the potential to have lower performance compared to Non-Big4 auditors. *Audit_fees* is estimated as the natural logarithm of audit fees. In a Korean setting, various studies demonstrate that audit fees are associated with an audit firm's incentives to demand a fee premium based on a client's audit risk (Mali and Lim, 2020; Lim and Mali, 2020). Therefore, we expect that audit fees will have a negative association with firm performance. Firms that are able to secure higher levels of debt relative to assets are likely to have higher level of performance for expansion. Thus, we expect to find a positive association between *Leverage* and firm performance.

<Insert Table 1 Roughly here>

ROA is estimated as profit after tax divided by total assets. As explained above, whilst relative efficiency can be considered an alternate to absolute efficiency measures such as ROA (Baik et al., 2013; Dermajian et al., 2012; Frijns et al., 2011; Mali and Lim), both are considered proxies for firm performance. Thus, a positive association is expected between *Relative_perform and ROA. Big_Own* is calculated as the percentage ownership of the largest shareholder. Large shareholders are involved in a firm's business strategy and operations and have been shown to demand robust governance to enhance reporting quality (Liu et al., 2018). Therefore, increasing shareholder equity ownership is expected to have a positive influence on firm performance. *Market_share* is calculated as firm share of sales divided by market share of sales. It can be expected that firms with higher market share have developed a comparative advantage relative to peers. Thus, we expect a positive association between market share and firm performance.

Because the study uses cross-sectional data, 0/1 dummy variables are included for i) each year to control for year effects; ii) 0/1 dummy variables are also included to control for industry effects, based on SIC codes. To control for the effect of outliers, all data is winsorized for the top/bottom 1%.

<Insert Table 2 Roughly here>

In Table 2, details about our sample selection process are shown. Data is collected from 2010, for 6 years to the end (start) of 2015 (2016). South Korea mandates that HC (continuous employment) information must be reported on Annual Reports from 2010. Therefore, 2010 is selected as the initial year because continuous employment data is available from 2010. 2015 is selected as the final year because it excludes the effects of business law interventions implemented prior to the impeachment of former South Korean president, Park Geun-Hye (You, 2021). The impact of Covid-19 is also excluded because it is still ongoing and only 2020 data is available (The COVID-19 started at the end of 2019, and 2021 data are not available at the time of our research). All variables have been downloaded from the established FNGuide database (DataGuide 5.0). 5,388 firm-year observations are downloaded for all firms. Financial institutions are excluded because they are shown to introduce bias into firm performance studies. We exclude 1,040 because HC data or financial data is unavailable, leaving a final sample of 4,348.

4. Empirical results

In Table 3, results of descriptive statistics are provided. For all variables, excluding dummy variables, mean and medians levels are almost at parity, and standard deviations are relatively low, implying that the sample is normally distributed. In Table 4, Pearson correlation results are listed. As expected, as the level of permanent employees increase, relative firm efficiency also increases (0.23***). Furthermore, without controlling for firm specific characteristics, relative firm efficiency is positively associated absolute performance (0.28***), leverage (0.09***) market share (0.09***) and shareholder concentration (0.08***). Relative firm efficiency is negatively associated with firm size (-0.03**) audit fee (-0.03*) and Big4 audit firm selection (-0.03*), consistent with our expectations.

<Insert Table 3 Roughly here>

<Insert Table 4 Roughly here>

In Table 5, OLS regression is used to determine the incremental effect of permanent employees (relative to temporary employees) on relative efficiency. The results demonstrate that the levels of permanent employment increase, a firm is more likely to achieve higher relative performance (Coeff, 0.07, t value 15.94). This relationship is consistent with our hypothesis that; firms that provide employees with permanent contracts are more likely to be profitable/efficient than firms that provide employees with temporary contracts. All independent variables are statistically significant and show the expected signs. Relative firm efficiency is positively associated with absolute performance (1.04***), leverage (0.19***), market share (0.19***) and shareholder concentration (0.12***). Relative firm efficiency is negatively associated with firm size (-0.04***), audit fee (-0.05***) and Big4 audit selection (-0.03***), again

consistent with our expectations. For further robustness, we conduct VIF tests for this, and all other analysis. We report untabulated results that our model is free from multicollinearity. As an additional analysis we re-run the model after excluding ROA. We report that the results remain qualitatively indifferent.

<Insert Table 5 Roughly here>

5. Additional Analysis

5.1 Permeant to temporary employment ratio analysis

For robustness, we conduct additional empirical analysis using the ratio of permanent contracts to temporary contracts as our dependent variable. The full-time employee ratio is estimated as permanent employees minus temporary employees. In Table 6, it is demonstrated that the percentage ratio of permanent/temporary contracts (as a dependent variable) has a positive impact on firm performance/efficiency (Coeff, 0.02, t value 4.44). The results show that firms that offer lower (higher) quality contracts on a relative basis have lower (higher) firm performance/efficiency. Taken together, the results continue to allow us to accept H.1.

<Insert Table 6 Roughly here>

5.2 Robustness tests: different firm performance proxies

In the main analysis, we use relative efficiency performance as our dependent variable. Moreover, we also re-run the original analysis after excluding ROA. Our results remain qualitatively indifferent. However, since we only use a single firm performance

measure, relative efficiency performance, research arguments may be less compelling. In order to overcome this, as a robustness check, the study provides results using different performance variables including ROA, ROE, Sales and TobinQ (after excluding ROA). In Table 7, we continue to find consistent results regardless of which performance measures are used as dependent variables, suggesting that when the levels of permanent employment increase, a firm is more likely to achieve higher firm performance (Using *ROA*: Coeff, 0.15, t value 13.71, *ROE*: Coeff, 0.02, t value 13.57, *Sales*: Coeff, 0.42, t value 41.52, *TobinQ*: Coeff, 0.06, t value 7.40).

<Insert Table 7 Roughly here>

5.3 Robustness tests: industry/firm clustered standard errors

In the main analysis, we conduct OLS regression analysis after controlling for industry and year fixed effects. However, the sample includes the same firms that are observed over the 2010-2015 sample period. In order to take this into account and to add further robustness, we repeat our analyses after 1) clustering standard errors at industry level, and 2) at firm level. In Table 8, robustness tests continue to show that relative firm efficiency performance increase with permanent employment 1) using industry clustered standard errors (Coeff: 0.07***, t value: 6.96) and 2) firm clustered standard errors (Coeff: 0.08***, t value: 8.55).

<Insert Table 8 Roughly here>

6. Conclusions and Discussion

The results have several important implications. First, mainstream financial reports, including the Annual Report, Corporate Social Responsibility Report and Integrated Report are all considered limited in terms of HC reporting quality, due to a lack of structure or coverage (Brennan et al., 2013; Cho et al., 2012; De Villiers and Sharma, 2020; Dumay, 2016; Flower, 2015; Gowthorpe, 2009; Menicucci, 2018). To enhance financial reporting transparency/quality and the accounting profession, NFR studies provide evidence that information that is currently excluded from mainstream financial reports can be considered informative to stakeholders (Baboukardos, 2017; Baboukardos and Rimmel, 2016; Jackson et al., 2019; KPMG, 2016; La Tore et al., 2018). As discussed below, this study extends the NFR literature by clearly demonstrating that NFR HC (temporary/permanent) contract information that is currently excluded from the mainstream accounting framework, can be utilized by stakeholders as a basis for firm value/performance inferences, ethics and policymaking.

Second, the study demonstrates a positive association between permanent contracts and firm performance using relative efficiency. Relative efficiency (estimated using Data Envelopment Analysis) is considered a felicitous measure of operational firm performance, because it is a measure of output generated, using inputs that are directly controlled by managers (Baik et al., 2013; Dermajian et al., 2012; Frijns et al., 2011; Mali and Lim, 2021). Thus, by demonstrating that increasing levels of permanent contracts are directly associated with day-to-pay operational performance, the study shows that organizational success is associated with contract quality. Third, whilst management are shown to have an incentive to reduce staff expenses to increase production efficiency (Merino, 1993; Stovall and Neill, 2017), we would encourage management to consider developing strategies to provide quality (permanent) contracts to enhance technical efficiency. To extend this study and to provide a more complete overview of

the effect on contract quality on firm performance, we would encourage future studies to develop empirical tests to demonstrate whether HC (temporary/permanent) is an intervening variable that influences firm risk (stock price volatility, TobinQ, WACC and credit ratings).

Fourth, the Annual Report is designed to provide (potential) shareholders with information for investment decision making purposes (IFRS, C., 2018). In Industry 4.0, IT and workforce ability will become increasingly important (Benešová and Tupa, 2017; Buer et al., 2018; Tamás, et al., 2016; Romero et al., 2015; Schuh et al., 2015; Terziyan et al., 2018; Wang et al., 2015). Furthermore, there is a growing trend amongst investors to demand information that validates a firm's HC ethics (Beal and Goyen 1998; Berry and Junkus, 2013; McLachan and Gardner 2004; Nilsson 2008). This study shows that the exclusion of basic HC contract (temporary/permanent) information from Annual Reports is an accounting framework limitation, because it is associated with firm performance. To address this limitation, we encourage legislators to consider adopting a HC framework similar to the numerical, structured, year-on-year basis, established in South Korea (Lim and Mali, 2021). We surmise that if the purpose of Annual Reports is to provide information to potential shareholders for decision making purposes (IFRS, C., 2018), HC information should be transparent.

Fifth, the study also explains how HC opaqueness can be determined to society. HC information is used by labour unions for collective bargaining (Americ, 1985; Blackett and Sheppard, 2003; Bosch, 2015; Craft, 1981; Gernigon et al., 2000; Hui, 2014; Maunders and Foley, 1984; Mautz, 1990; Shen et al., 2008; William et al., 2020). However, as a result of Industry 4.0, there will be increasing levels on unemployment (Stojanova et al., 2019; Bonekamp et al., 2015). Therefore, whilst firms with robust HC policies have an incentive to report robust HC reporting quality as a legitimacy theory

(Guthrie et al., 2004; 2006), equally, because there is no policy to mandate that HC information must be reported on Annual Reports, management can choose to report HC as an image management strategy (Abeysekera and Guthrie, 2004, 2005; Tinker, 1980; Tinker and Neimark, 1987). Taken together, as a result of increasing unemployment and contract quality opaqueness, without a policy intervention, the contract rights of workers are at risk. We would therefore encourage future studies to address this issue as a societal concern.

Sixth, the study offers insights to explain how HC and productivity strategies can influence economies. Following the Korean War in 1950, because of a lack of natural resources, South Korea's national productivity strategy has focused on HC development (Hundt, 2015; Kim, 2010; Kim and Rowley, 2006; Lee, 2005; Lee, 2015; Lim and Mali, 2020). Moreover, South Korea has high levels of HC reporting quality (Lim and Mali, 2021). On the other hand, the UK has low levels of HC quality (Bassi et al., 2015; Fincham and Roslender, 2003; Li et al., 2008; Striukova et al., 2008; Roslender and Stevenson, 2009; Vandemaele, et al., 2005). In the UK, there is increasing evidence that the employee contract terms are being reduced (Farina et al., 2020; Koumenta and Williams, 2019). Furthermore, the UK's low productivity is recognized as the 'productivity problem'. In the UK, the extent to which the 'productivity problem' can be associated with firm-level efficiency is a question left unanswered, because of HC reporting limitations. Thus, for the UK, and other countries with low national productivity and HC reporting quality, this study can be used as a case study to infer that low HC reporting quality can be detrimental to economies.

Finally, limitations are listed. South Korea has high HC reporting quality (Lim and Mali, 2021). However, whilst HC reporting quality is high in South Korea, not all variables included on Annual Reports are available on the FNGuide database. Therefore,

a sample of roughly half of all available firms are used for this analysis. However, because the sample is large, it can be considered indicative of the population. Thus, results can be considered robust. Furthermore, 2016 is selected as a final sample year because i) the introduction of new labour laws associated with the impeachment of former president Park Geun-Hye (You, 2021). ii) We also exclude the COVID-19 period because of the lack of data availability and the COVID-19 pandemic effect may also have an intervening effect on business efficiency. In short, we select a period of relative business stability to conduct this study. However, the Covid-19 pandemic may highlight the importance of social capital, and thus we suggest that future study could make use of the COVID-19 setting to examine this topic concerning human capital, when COVID-19 data is sufficiently available.

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