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The Nexus between Employment Relationship and Innovation

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This study explores the nexus between employment relationship and innovation. Cross-country data is collected through the Executive Opinion Survey (EOS) by the World Economic Forum. More specifically, this study used a dataset from 112 developed and developing countries from 6 regions of the world, with a time period of 10 years (2006-15). Regression estimates show significantly positive association among employment relationship and innovation. These results verify that strong and elastic employment-relationships permit an easy alteration in the number, pay scale and working hours of employees according to need, which subsequently fosters competitiveness. Moreover, employment relationship as human capital strategies direct the knowledge, expertise and capabilities which then enhances innovation. We also find that such associations between employment relationship and innovation are more pronounced among developed economies as compared to developing economies. Developed countries have efficient labour markets and labour laws that protect the rights of labour and limit their dismissal, which subsequently fosters innovation. These results also confirm that the neo-classical economics approach which states that rigorous labour-market laws and regulations imperil innovation.

Key words: *Employment Relationship, Innovation, Developed Economies, Developing Economies.*

Introduction

It is so far extensively accepted in the prior literature that innovation performs a critical part in enterprise, competitive advantage and growth (Macher & Mowery, 2009). Its prominence makes it a subject of attention and highlights the significance of defining new tactics to innovate together with its associated factors (Damanpour & Schneider, 2006; Subramaniam & Youndt, 2005). When we thought about entrepreneurial success, a question comes to mind "what makes a company successful?" The answer may be diverse e.g. profits, sales, marketing strategies, creativity, enterprise vision and mission, and so on. But the underlying feature behind all aforementioned indicators of success is employment relationship.

Previous literature and empirical work pay very much devotion to recognising the bases of innovativeness, along with the elements and obstacles to innovativeness. The pre-requisites of innovativeness contain the factors that direct effect innovativeness i.e., human capital (in term of employees competence, educational level, knowledge and skills, research staff), knowledge accumulation (research and development expenditure), material resources (machinery and equipment, patents and licenses), financial means (financial market development, access to finance), and organisational factors (firm size, firm legal status, available resources) (Wziątek-Kubiak & Balcerowicz, 2009; Xiao & Zhao, 2012). Undeniably, human capital performs a key role in the course of innovation and competitiveness e.g. management style, risk-taking behaviour, employee attitude, employment relationship and so on.

The term "employment relationship" describes the linkage between the organisation/employer and individual employees. Such a relationship has certain goals such as stabilising, directing and regulating employees' attitude (Van Hootegem, 2000). It can also be elaborated as "the legal creation in which one person (the employee) agrees for a sum of money specified over some time period to provide labour to another person (the employer) and follow the employer's orders and rules regarding the performance of work, at least within limits" (Kaufman, 2004). In this relationship (employer-employee), three features are important, these arejob safety, financial compensation and working period (Sparrow & Cooper, 2012).

Employers also recognise the significance of workers as a prime foundation of innovativeness and creativity. According to the UNIZO survey 2008, approximately 35% of employers from SMEs (small and middle enterprises) specified that their employees are the key source of innovativeness. Similarly, CIS (Community Innovation Survey) also specifies that nearly 50% of employers from European innovative firms consider inside resources (including employees) as the foundation of innovativeness (De Spiegelaere, 2014). That's why most innovative organisations (like Google, Microsoft, Facebook, Yahoo and so on) give so many incentives and benefits to their employees. According to the latest studies, organisations that deal with employees better are more innovative as compare to other counterparts.

This study evaluates the empirical connection between employment relationship and capacity of innovation in both developed and developing economies. According to the empirical findings, the employment relationship has a significant impact on the capacity of innovation. However, as compared to developing economies, such liaison is more pronounced among developed countries, because of the efficient labour market, protected labour laws and well-organised regulatory structure. These results are also verified by using pay and productivity as a proxy for the employment relationship, which shows that countries with effective pay and productivity environment have more capacity to innovate. Policy implications recommend that a strong employment relationship enhances the capacity of innovation in both developed and developing economies, therefore, it is needed to implement effective laws and regulations to strengthen the labour market which subsequently fosters innovation. Our study contributes to the field of institutional and labour economics in three ways. Firstly, we use a unique dataset, containing 1120 observations from 112 developed and developing countries. Secondly, we conduct the empirical evaluation by considering countries' development status i.e., developed and developing countries. Thirdly, we utilise diverse indicators to measure employment relationship i.e., cooperation in the employment relationship and pay and productivity.

The rest of the paper is organised as follows: Section 2 deals with review of the literature and construction of the hypothesis. Section 3 discusses methodology along with detail discussion about sample of the study, data sources, variables selection and measurement and development of econometric models for further analyses. In section 4, empirical results are reported with the explanation. Section 5 contains conclusion and policy implications.

Literature Review and Hypothesis Development

Recently, academic literature on innovation and creativity has flourished. To obtain a competitive advantage, entities/countries have to focus on creating new/innovative ideas and subsequently better products. Wide technological literature branches are constructed around diverse aspects of innovation e.g. open-innovation (Chesbrough, 2006), organisational-innovation (Damanpour, 1991) and recently, workplace-innovation. In line with such aspects, a discussion has been started on employment relationship and innovativeness (competitiveness). As per neo-classical economists, rigorous labour-market laws and regulations imperil the innovativeness of both entities' and nations' economies (Kleinknecht, Alfred, 1998). Strong and elastic employment-relationships might permit them to easily alter the number, pay scale and working period of employees according to the need, which subsequently fosters competitiveness (Sels & Van Hootegem, 2001).

According to Wang et al. (2003), "the employment relationship is an exchange between the contributions expected from the employee and the inducements offered by the employer". In

simple words, employment-relationship is a swap of services offered by an employee in term of compensation given by employer (Bosch, 2004). Employment relations can be linked with innovation in two aspects, direct and indirect. In a direct way, the employment relationship describes the human capital strategies which encourage innovative behaviours (Ichniowski et al., 1997; Wang et al., 2003). In an indirect mode, employment relationship is an approach to manage human resources and direct the knowledge, expertise and capabilities which subsequently enhance innovativeness (Lepak & Snell, 2002; Lepak et al., 2003). It can be argued that compensation and expectation which stimulate employee behaviour might also have an impact on human capital, which consequently enhances innovativeness and competitiveness.

Acharya and Subramanian (2009), found that efficient labour-laws that limit the removal of workforce enhance corporate innovation. In the same way, Francis et al. (2011) showed that golden handshakes and long-lasting incentives (stock options, retirement benefits) have a positive and statistically significant effect on innovation, quantified as patents and citations. Tian and Wang (2011), discovered that entities supported by venture capital are more innovative because of tolerating the behaviour. Seru (2014), stated the proof that high-level executives in companies are hesitant to invest in innovation due to the threat of failure as well as re-allocation of resources by HQs.

According to a new study, Berle and Means (1991) explain the possible issues raised by the division of ownership and control. In large organisations, owners (shareholders) assign the right to make decisions to employees (managers), who can manage resources for their own benefits. Compensation tactics equivalent to the interest of managers can significantly reduce such probable issues between owners and employees. Similarly, Holmstrom (1989) proposed a substitute clarification for why compensation tactics that promote innovation exhibit tolerant behaviour. The author argued that performance-based incentives for innovation are clamorous, thus owners (principal) have to adopt other incentive schemes (e.g. sale-based) to promote innovation. In the same manner, Aghion and Tirole (1994) claim that innovative related actions are impulsive and, thus, difficult to contract ex-ante (before the innovation).

Resource-based and knowledge-based views are significantly important to explain innovativeness. These views argue that workers' knowledge (human capital) and its administration (employment relationships) describe innovativeness and competitiveness (Lopez-Cabrales et al., 2009; Subramaniam & Youndt, 2005). As per the resource-based perspective, entities can obtain competitive gain by applying their internal resources and abilities. Thus, a sustainable competitive edge can be attained by owing particular resources that can't be simply simulated or replaced (Barney, J., 1991). These resources and capabilities help to enhance the capacity for innovation. Moreover, the probability of fruitful innovations relies on the commitment made by firms' employees, which is based on job security and

stability (Acharya et al., 2013). However, such liaison can be damaged in the case of short-tenure and temporary employment contracts (Michie & Sheehan, 1999; Zhou et al., 2011). Previous literature also identified the negative association between flexible employment relationships and innovation. Studies such as Kleinknecht, Ah et al. (2013), Kleinknecht, Kleinknecht, Alfred et al. (2014), and Storm and Naastepad (2007), demonstrate that flexible relationships between employer and employees possibly damage the long-term competitiveness, rather than constructing it.

Previous studies elaborate on two forms of employment relationship., "mutual-investment model (MIM) and quasi-spot contract (QSC)" (Bornay-Barrachina et al., 2012). In MIM, employers usually spend on valuable employees which are highly beneficial and perform an important role in a firms' future success. Such a relationship emphasises training and developmental practices, in addition, offers career prospects together with high perks and allowances (Lepak & Snell, 1999; Pfeffer, 1997). However, the QSC approach is regarded as a relationship between employer and those employees which are easily accessible from the labour market and can't be reflected as a cause of competitive edge.

Innovation is an important corporate policy which lifts the long-term development and augments organisational competitiveness. Innovation rises when energetic, encouraged, and motivated individuals create novel ideas and transform them into innovations (products, services, business models and so on) (Chang et al., 2015). Innovative activities involve the examination of novel and previously unexplored aspects which have higher chances of failure. Hence, incentives connected with performance (in case of innovative activities) lower the rewards, which consequently discourage employees to involve in innovative projects. Alternatively, the ideal incentive structure that encourages innovative activities exhibits considerable patience for initial stage failure and incentive for long-term achievement (Manso, 2011). The key factor to develop innovation is the supportive behaviour and motivation of each employee within an organisation. Thus an employee has responsibility to pursue and identify the untraditional and unique ways of attaining goals and carrying out tasks. Nevertheless, it is also essential to form an atmosphere that provides job safety and security, and an efficient incentive scheme (Szczepańska-Woszczyna, 2014). These elements are not only important to encourage employees but also promote innovation. Based on these arguments, we draw the following hypothesis.

H: There is a positive nexus between employment relationship and innovation.

Research Design

Sample Construction

To evaluate the study hypothesis, we constructed a dataset that consists of 112 countries (both developed and developing) from diverse geographic regions. We use Global Competitiveness Reports (GCR) to collect country-level data. GCR is a yearly report released by the World Economic Forum (WEF). This report enlightens the economic situation of a country with-respect-to 12 aspects i.e., " (1) institutions, (2) infrastructure, (3) macroeconomic environment, (4) health and primary education, (5) higher education and training, (6) goods market efficiency, (7) labour market efficiency, (8) financial market development, (9) technological readiness, (10) market size, (11) business sophistication, and (12) innovation".

The aim of the study is to evaluate the nexus between employment relationship and innovation. To examine that nexus, we collect samples from 112 nations, which are further classified into (37)-developed and (75)-developing economies across different geographic regions around the globe. Moreover, the study dataset consists of a total of 1120 observations across the time frame of 10 years (2006-2015).

Sample countries include 23 from African region "*Algeria, Botswana, Burundi, Cameroon, Chad, Egypt, Ethiopia, Gambia, Kenya, Lesotho, Madagascar, Mali, Mauritania, Mauritius, Morocco, Mozambique, Namibia, Nigeria, South Africa, Tanzania, Uganda, Zambia, and Zimbabwe*", 28 from Asian region "*Bahrain, Bangladesh, Cambodia, China, Hong Kong SAR, India, Indonesia, Israel, Japan, Jordan, Kazakhstan, Korea, Kuwait, Kyrgyz Republic, Malaysia, Mongolia, Nepal, Pakistan, Philippines, Qatar, Russian Federation, Singapore, Sri Lanka, Taiwan, Thailand, Turkey, United Arab Emirates, and Vietnam*", 37 from European region "*Albania, Armenia, Austria, Azerbaijan, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Georgia, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Macedonia, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovak, Slovenia, Spain, Sweden, Switzerland, Ukraine, and United Kingdom*", 12 from North American region "*Canada, Costa Rica, Dominican, El Salvador, Guatemala, Honduras, Jamaica, Mexico, Nicaragua, Panama, Trinidad and Tobago, and United States*", 10 from South American region "*Argentina, Bolivia, Brazil, Chile, Colombia, Guyana, Paraguay, Peru, Uruguay, and Venezuela", and 2 from Oceanian region "Australia, and New Zealand*".

Variables Measurement

The dependent variable of this study is a unique country-specific indicator to explain the capacity of innovation (Usman, 2017). This indicator is collected via the Executive Opinion Survey (a survey conducted by the World Economic Forum) question, which states "In your

country, to what extent do companies have the capacity to innovate? [1 = not at all; 7 = to a great extent]". Such information is only possible on a global scale with the help of WEF's Executive Opinion Survey.

The independent variables of the study are novel measures of employment relationship. To measure these indicators, we use country-level information regarding employer relationships. On the scale of 1 to 7, our first variable inquires "How would you characterise labour-employer relations in your country? [1 = generally confrontational; 7 = generally cooperative]". Based on this indicator, we also construct another variable i.e., dummy indicator, represents "1" if the employment relations are greater than the sample median and "0" if not. These indicators demonstrate the overall labour-employee (employment) relationship within a particular country.

To empirically examine the association between employment relationship and innovation, we use diverse nature of control variables i.e., university-industry collaboration, the extent of staff coaching, secondary educational enrolment, direct foreign investment and technology transmission, government acquisition of cutting-edge technology, and gross domestic product (GDP). Most of the aforementioned indicators are gathered by using the Executive Opinion Survey, except, Secondary Educational Enrolment and GDP which are collected from UNESCO and WDI, respectively. These indicators are also used in the previous study of Usman (2017), in which the author examined the linkage between university-industry relationship and innovation.

Figure 1. Capacity for Innovate and Employment Relationship (Region Wise)

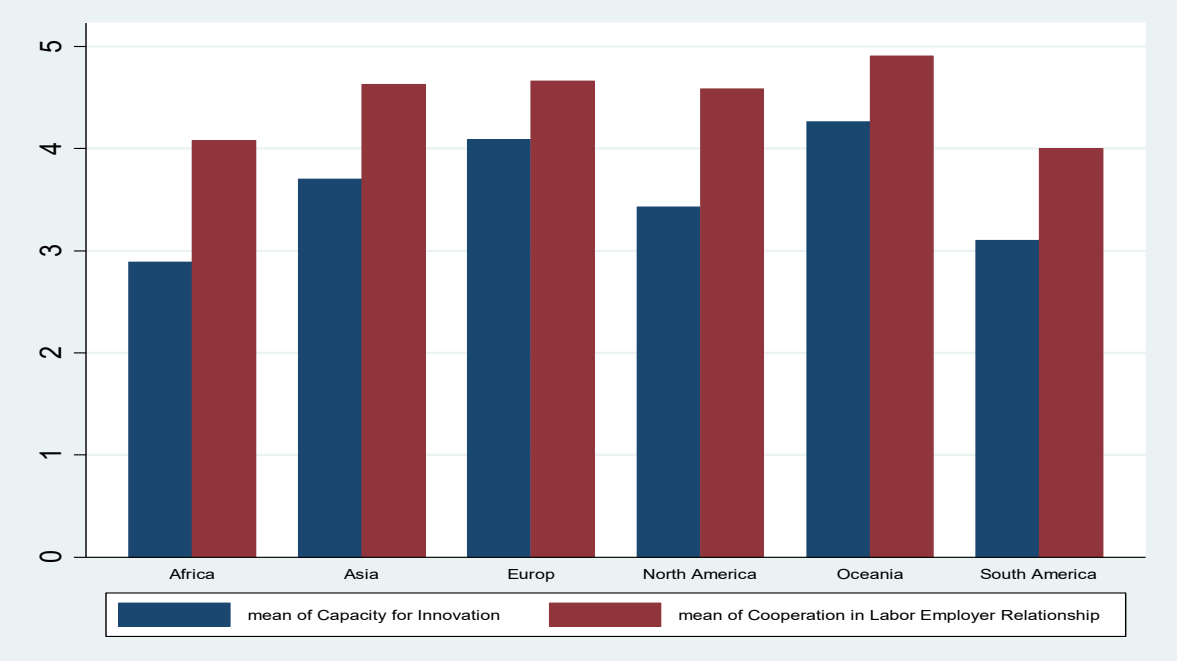
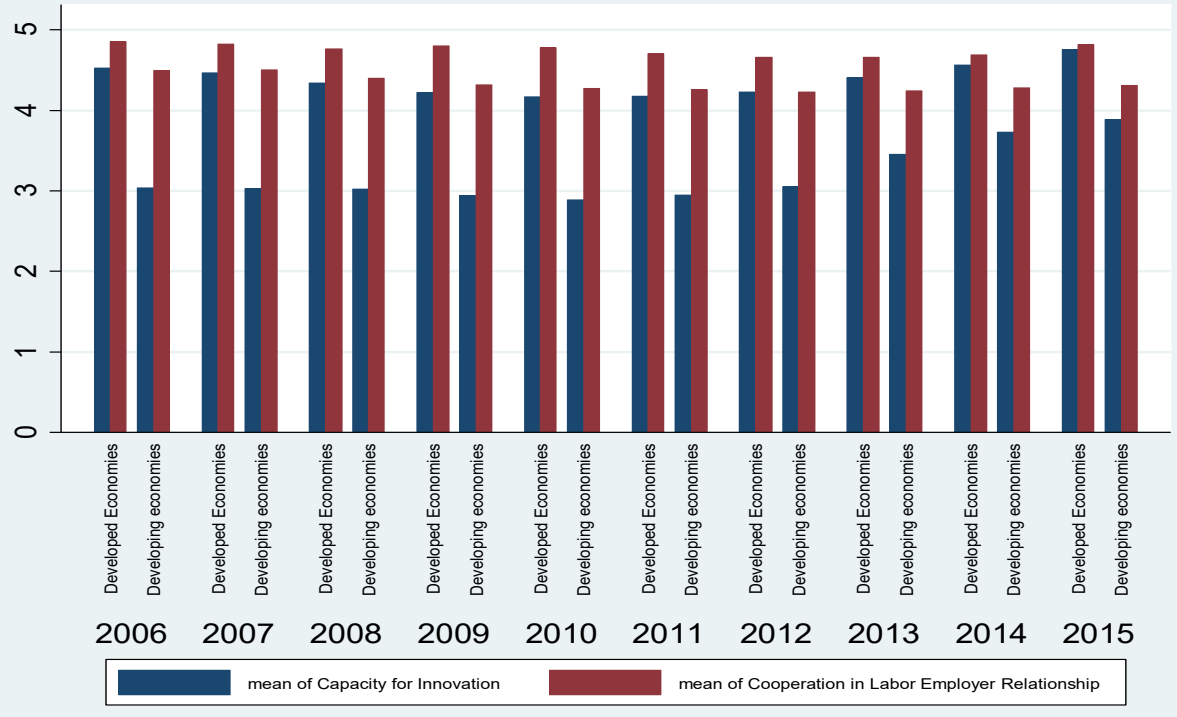


Figure 2. Capacity of Innovation and Employment Relationship (Developmental Status & Time)



Additionally, we explore the graphical representation of sample with-respect-to innovation (capacity of innovation) and employment relationship (cooperation in the employment relationship). Figure 1, presents the innovation and employment-relationship across different regions. Furthermore, figure 2 shows the employment-relationship and innovation based on countries' developmental status and across time.

Table 1: Variables Name, Symbols, Measures

Variables Name	**Symbols**	**Measures**
Capacity of Innovation	COF	A scale from 1 to 7, which shows the capacity of companies to innovate
Employer Relationship	ER	A scale from 1 to 7, which shows the cooperation in the employment relationship.
Employer Relationship (Dummy)	ERD	Dummy indicator, represents "1" if the employment relationship is greater than the sample median and "0" if not.
University-Industry collaboration	UIC	A scale from 1 to 7, which shows the degree of collaboration between university and industry R&D.

Extent of Staff Coaching	ESC	A Scale from 1 to 7, which shows the degree of companies' investment in staff coaching.
Secondary Educational Enrolment	SEE	The gross educational enrolment rate in the secondary level.
Foreign Direct Investment and Technology Transmission	FDI-TT	A scale from 1 to 7, which shows the level of FDI and technology transmission in a country.
Government Acquisition of Cutting-edge Technology	GACET	A scale from 1 to 7, which shows the governmental purchases regarding cutting edge technology.
Gross Domestic Product	GDP	Log value of GDP (in B.$)

Empirical Model and Estimation Tools

For evaluating the nexus among employment relationship and innovation, we apply the OLS regression model along with countries' fixed-effect approach. Furthermore, to investigate any difference in the afore-mentioned relationship with-respect-to developmental status, we divide the study dataset into developing and developed economies. Additionally, to investigate further, the full dataset is distributed into a strong and weak employment relationship. Lastly, we use the following econometric model to estimate the desired relationship.

$$Capacity\ of\ Innovation_{kt} = \beta_0 + \beta_1 Employment\ Relationship_{kt} + \sum_{j=1}^{6} \beta_j\ Control\ Indicators_{kt} + \varepsilon_{kt}$$

Control variables include university-industry collaboration, the extent of staff coaching, secondary educational enrolment, direct foreign investment and technology transmission, government acquisition of cutting-edge technology, and GDP.

Results and Discussion

Table 2 highlights the descriptive statistics of all the variables which are used to estimate the nexus among employment relationship and innovation. The capacity of innovation has a mean of 3.5896, with a standard deviation of 0.9624. On the scale of 1 to 7 (the best), cooperation in the employment relationship shows an average value of 4.4699, with a standard deviation of 0.6933. These indicators elaborate on the overall environment of countries with respect to innovation and employment relationship.

Table 2: Descriptive Results

Variables	Obs.	Mean	Std. Dev.	Min.	Max.
Capacity of Innovation	1,120	3.5896	0.9624	1.7815	6.1367
Employer Relationship	1,120	4.4699	0.6933	2.4704	6.3215
Employer Relationship (Dummy)	1,120	0.5000	0.5002	0	1
University Industry Collaboration	1,120	3.6917	0.9480	1.6000	5.9681
Extent of Staff Coaching	1,120	4.0505	0.7580	1.6978	5.9455
Secondary Educational Enrolment	1,118	82.2627	26.4648	5.8722	150.3240
GDP (Log)	1,120	6.9328	3.5370	0.7939	16.4434
Foreign Direct Investment and Technology Transmission	1,120	4.7071	0.6411	2.6851	6.4338
Government Acquisition of Cutting-edge Technology	1,120	3.6061	0.6446	1.6330	6.1804

According to the dataset, university-industry collaboration displays a mean value of 3.6917 (min= 1.6000, max= 5.9681). An indicator of the extent of staff coaching exhibits a standard deviation of 0.7580, with an average value of 4.0505. To measure the educational level within countries, a secondary education enrolment rate is used, which shows an average of 82.2627. A log of gross domestic product (GDP) presents a mean value of 6.9328. On the scale of 1 to 7 (the best), foreign direct investment and technology transfer explains a standard deviation of 0.6411 and a mean value of 4.7071. Lastly, government acquisition of cutting-edge technology elaborates an average value of 3.6061, with a minimum value of 1.6330 and a maximum value of 6.1804.

Table 3 estimates the correlation coefficient matrix within variables. Before moving towards regression evaluation, it is essential to examine the possible concern of collinearity, which can lead to biased results. As per the correlation matrix results, we cannot find any indication of multi-collinearity among variables. Moreover, most of the variables are in-line with a theoretical perspective. To further verify the possible collinearity issue, we also incorporate the VIF (Variance Inflation Factor) technique with all regression models. The results of VIF show that there is no issue of collinearity among variables. The outcomes of VIF are shown in concerned regression tables.

Table 3: Correlation Matrix

	COF	ER	ERD	UIC	ESC	SEE	GDP	FDI-TT	GACET
COF	1.000								
ER	0.547	1.000							
ERD	0.406	0.794	1.000						
UIC	0.853	0.551	0.413	1.000					
ESC	0.795	0.669	0.521	0.841	1.000				

SEE	0.543	0.328	0.303	0.537	0.565	1.000			
GDP	0.223	0.154	0.173	0.074	0.137	0.148	1.000		
FDI-TT	0.377	0.516	0.460	0.493	0.559	0.330	0.283	1.000	
GACET	0.589	0.609	0.497	0.642	0.671	0.284	0.225	0.616	1.000

COF=Capacity of Innovation, ER=Employment Relationship, ERD=Employment Relationship (Dummy), UIC=University Industry Collaboration, ESC=Extent of Staff Coaching, SEE=Secondary Educational Enrolment, GDP=GDP (Log), FDI-TT=Foreign Direct Investment and Technology Transmission, GACET=Government Acquisition of Cutting-edge Technology

The regression evaluation technique (OLS) is used to examine the empirical association between employment relationship and innovation. To estimate such a connection, we use cooperation in the employment relationship and a dummy variable of cooperation as independent variables. After using a wide range of control variables together with country fixed effect, results in table 4 show a positive and significant impact of employment relationship on innovation. More specifically, results demonstrate that one unit increase in cooperation in the employment relationship will cause 0.2374 points increase in countries' capacity of innovation. Similar results are found by using a dummy variable of cooperation in employment relationship i.e., countries with higher cooperation in an employment relationship are more innovative.

Table 4: Regression Analyses (Full Sample)

Dependent Variable: Capacity of Innovation	**Employment Relationship**		**Employment Relationship (Dummy)**	
	Coefficients	**V.I.F.**	**Coefficients**	**V.I.F.**
Independent Variables:				
Employment Relationship	0.2374***	2.03		
	(5.02)			
Employment Relationship (Dummy)			0.0662*	1.51
			(1.85)	
Control Variables:				
University Industry Collaboration	0.5182***	3.75	0.5147***	3.77
	(10.75)		(10.56)	
Extent of Staff Coaching	0.3560***	4.86	0.3848***	4.49
	(7.57)		(8.17)	
Secondary Educational Enrolment	0.0155***	1.59	0.0153***	1.60
	(8.02)		(7.82)	
GDP (Log)	0.0401***	1.13	0.0424***	1.13
	(8.15)		(8.56)	
Foreign Direct Investment and Technology Transmission	-0.3044***	1.83	-0.2548***	1.84
	(-6.32)		(-5.35)	
Government Acquisition of Cutting-edge Technology	-0.1020***	2.50	-0.0800**	2.46

	(-2.43)		(-1.90)	
Country Effect	Yes		Yes	
Number of Observation	1,118		1,118	
F-Stat	72.81		71.08	
Prob.>F	0.0000		0.0000	
R^2	0.8958		0.8936	
Adjusted R^2	0.8835		0.8810	

* 0.10, ** 0.05, *** 0.01, t-stat in parentheses

To uncover the impact of employment relationship on innovation with respect to countries' developmental status, the study sample is distributed into two, developed/developing. According to the results shown in table 5, the association between employment relationship and innovation is more pronounced among developed economies compared with developing economies. More precisely, one unit increase in cooperation in the employment relationship will increase the capacity of innovation by 0.2590 (developed countries) and 0.2375 (developing countries). Developed countries have efficient labour markets and labour laws, which protect the rights of labour and limit their dismissal, and subsequently foster innovation (Acharya & Subramanian, 2009). These results also confirm the neo-classical economics approach, which states that rigorous labour-market laws and regulations imperil innovativeness (Kleinknecht, Alfred, 1998).

Table 5: Regression Analyses (Developmental Status)

Dependent Variable: Capacity of Innovation	**Employment Relationship (Developed Countries)**		**Employment Relationship (Developing Countries)**	
	Coefficients	**V.I.F.**	**Coefficients**	**V.I.F.**
Independent Variable:				
Employment Relationship	0.2590***	3.18	0.2375***	1.79
	(3.40)		(3.91)	
Control Variables:				
University Industry Collaboration	0.3368***	3.24	0.5810***	3.17
	(5.00)		(8.92)	
Extent of Staff Coaching	0.5200***	6.81	0.2789***	3.84
	(6.08)		(4.40)	
Secondary Educational Enrolment	0.0071*	1.14	0.0169***	1.37
	(1.82)		(7.34)	
GDP (Log)	0.0337***	1.34	0.0420***	1.19
	(4.54)		(6.34)	
Foreign Direct Investment and Technology Transmission	-0.1791**	1.18	-0.3298***	2.45

	(-2.32)		(-5.37)	
Government Acquisition of Cutting-edge Technology	-0.3771***	2.54	-0.0190	2.71
	(-6.16)		(-0.35)	
Country Effect	Yes		Yes	
Number of Observations	370		748	
F-Stat	108.95		27.15	
Prob.>F	0.0000		0.0000	
R^2	0.9349		0.7675	
Adjusted R^2	0.9264		0.7393	

* 0.10, ** 0.05, *** 0.01, t-stat in parentheses

These results verify that strong and elastic employment-relationship permit an easy alteration in the number, pay scale and working hours of employees according to the need, which subsequently fosters competitiveness (Sels & Van Hootegem, 2001). Moreover, employment relationships as human capital strategies direct the knowledge, expertise and capabilities which subsequently enhance innovativeness (Lepak & Snell, 2002; Lepak et al., 2003). These results are parallel with resource-based and knowledge-based views, which demonstrate that workers' knowledge and its administration (employment-relationships) describe innovativeness and competitiveness (Barney, J. B. & Wright, 1998; Lopez-Cabrales et al., 2009).

As per control variables are concerned, university-industry collaboration shows a positive and statistically significant impact on countries' capacity of innovation. Such results propose that academia contributes to the development of human resources (D'este & Patel, 2007), which consequently influence the capacity of innovation. Similarly, the extent of staff coaching also presents a positive impact on the capacity of innovation. High-level employee coaching prepares individuals with creativity, ideas and modern techniques. Such characteristics eventually boost the capacity of innovation (Lin, 2016). Results show that secondary education enrolment has a significantly positive relationship with the capacity of innovation. It's a well-established reality that higher literacy enriches innovative abilities such as, intelligence, productiveness and skilfulness.

Countries' gross domestic product (GDP) also witnesses a significantly positive relationship with the capacity of innovation. An increase in GDP offers an appropriate economic atmosphere to create knowledge, develop ideas and utilise technology, which consequently enhances innovative abilities (Xiao & Zhao, 2012). Lastly, foreign direct investment, and technology transmission and government acquisition of cutting-edge technology have a significantly negative relationship with the capacity of innovation. The possible reasons for such negative relationships are, firstly, foreign direct investment and technological

transmission and technology acquisition raise cutting-edge technology within an economy, but the expertise/creativity within that economy can't increase. Such enhancement in technologies might have a positive impact on innovation for the short term, but in the long term, it has a negative relationship with innovation.

Robustness Check

For checking the robustness of our previous results, pay and productivity as an independent variable is used to estimate the employment relationship. This indicator is also taken from GCRs and calculate through the Executive Opinion Survey. This variable gathers information via survey question which states "To what extent is pay in your country related to productivity? [1 = not related to worker productivity; 7 = strongly related to worker productivity]". Moreover, this indicator shows a mean of 4.0332, with a minimum value of 2.1031 and a maximum value of 6.0404. Along with such an indicator (pay and productivity), we also include a dummy variable as an independent variable for robust evaluation i.e., dummy indicator, represents "1" if pay and productivity is greater than the sample median and "0" if not.

Regression results in table 6 show the positive and significant impact of pay and productivity on the capacity of innovation: one unit increase in pay and productivity will enhance the capacity of innovation by 0.1254 points. Similar results are found by using a dummy variable for pay and productivity; countries with high pay and productivity have a higher capacity of innovation. Moreover, to examine such a relationship according to countries developmental status, we again categorised the full sample into developed and developing countries. As per the results reported in table 7, we found that liaison between pay and productivity, and capacity of innovation is more prominent among developed economies as compared to developing economies. More precisely, one unit increase in pay and productivity fosters the capacity of innovation by 0.1465 (developed countries) and 0.0991 (developing countries).

Table 6: Regression Analyses (Full Sample) Robust Check

Dependent Variable: Capacity of Innovation	**Pay and Productivity**		**Pay and Productivity (Dummy)**	
	Coefficients	**V.I.F.**	**Coefficients**	**V.I.F.**
Independent Variables:				
Pay and Productivity	0.1254***	1.80		
	(2.71)			
Pay and Productivity (Dummy)			0.0583	1.33
			(1.56)	
Control Variables:				
University Industry Collaboration	0.5184***	3.78	0.5174***	3.79
	(10.65)		(10.60)	

Extent of Staff Coaching	0.3423***	4.43	0.3735***	4.38
	(6.83)		(7.75)	
Secondary Educational Enrolment	0.0149***	1.65	0.0153***	1.64
	(7.64)		(7.80)	
GDP (Log)	0.0393***	1.15	0.0422***	1.14
	(7.66)		(8.47)	
Foreign Direct Investment and Technology Transmission	-0.2554***	1.82	-0.2412***	1.80
	(-5.41)		(-5.13)	
Government Acquisition of Cutting-edge Technology	-0.0883**	2.60	-0.0772*	2.46
	(-2.09)		(-1.83)	
Country Effect	Yes		Yes	
Number of Observations	1,118		1,118	
F-Stat	71.39		71.00	
Prob.>F	0.0000		0.0000	
R^2	0.8940		0.8935	
Adjusted R^2	0.8815		0.8809	

* 0.10, ** 0.05, *** 0.01, t-stat in parentheses

Table 7: Regression Analyses (Developmental Status) Robust Check

Dependent Variable: Capacity of Innovation	**Pay and Productivity (Developed Countries)**		**Pay and Productivity (Developing Countries)**	
	Coefficients	**V.I.F.**	**Coefficients**	**V.I.F.**
Independent Variable:				
Pay and Productivity	0.1465***	1.59	0.0991*	2.25
	(2.06)		(1.68)	
Control Variables:				
University Industry Collaboration	0.3330***	3.25	0.5823***	3.09
	(4.89)		(8.83)	
Extent of Staff Coaching	0.5547***	4.91	0.2757***	3.98
	(6.37)		(4.04)	
Secondary Educational Enrolment	0.0073*	1.33	0.0167***	1.48
	(1.86)		(7.15)	
GDP (Log)	0.0286***	1.24	0.0436***	1.29
	(3.78)		(6.31)	
Foreign Direct Investment and Technology Transmission	-0.1789**	1.31	-0.2668***	2.35
	(-2.27)		(-4.48)	
Government Acquisition of Cutting-edge Technology	-0.3479***	2.56	-0.0073	2.98

	(-5.67)		(-0.13)	
Country Effect	Yes		Yes	
Number of Observation	370		748	
F-Stat	106.42		26.50	
Prob.>F	0.0000		0.0000	
R^2	0.9335		0.7632	
Adjusted R^2	0.9247		0.7344	

* 0.10, ** 0.05, *** 0.01, t-stat in parentheses

Conclusion

The core purpose of this research paper is to investigate the nexus between employment-relationship and innovation. To accomplish such objectives, cross-country data is collected through the World Economic Forum's Executive Opinion Survey (EOS), which are reported in Global Competitiveness Reports (GCRs). More specifically, 112 countries from 6 regions of the world, with the time period from 2006-15 were used. Moreover, the study sample is divided into two major categories based on countries' developmental status, developed countries (37) and developing countries (74). We use two proxies to estimate employment relationship (co-operation in the employment relationship, and pay and productivity) and one proxy for innovation (capacity of innovation). After using the diverse nature of control variables (university-industry collaboration, the extent of staff coaching, secondary educational enrolment, foreign direct investment and technology transmission, government acquisition of cutting-edge technology, and GDP), regression estimates show significant positive nexus among employment relationship and innovation. Furthermore, such association is more pronounced among developed economies compared with developing economies.

Additionally, for checking the robustness of the aforementioned outcomes, an alternate proxy for employment relationship, pay and productivity is used. By using the same control variable (as mentioned above), regression estimates present a positive relationship among pay and productivity, and capacity of innovation. This linkage is more distinct among developed nations compared with developing nations. These estimates are consistent with a resource-based viewpoint, which states that "organisations can attain competitive advantage by using their inner resources and capabilities". Therefore, a maintainable competitive position can be achieved by owing to certain resources that cannot be easily simulated or replaced (Barney, J., 1991). These resources and abilities help to foster the capacity for innovation. Moreover, a strong employment relationship emphasises training and developmental activities, in addition, offers career opportunities together with significant perks and allowances, which ultimately promote innovation (Lepak & Snell, 1999). Policy implications suggest that strong

employment-relationship enhances the capacity for innovation in both developed and developing economies, therefore, it is needed to implement effective laws and regulation to strengthen labour market and protect labour rights, which subsequently foster innovation. These steps are not only essential to stimulate innovation but also important for economic development and growth.

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