

Social Capital and Trade Unions in the Green Economy: The Case of Taiwan

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1. Introduction

Over the past two decades, Taiwan's economy has become more open and liberalized due to the influence of the globalization of the world economy. The opening up and the liberalizing of the Taiwan economy has not only affected its industrial structure but also the composition of its workforce and industrial relations system. In terms of its industrial structure, Taiwan's labor-intensive industries quickly relocated their production facilities abroad during the late 1980s, mostly to mainland China and other Southeast Asian countries, in order to take advantage of the low labor costs. Those that stayed behind rapidly upgraded themselves into high-tech or other high value-added industries as well as knowledge-intensive service industries. Accompanying these changes were major shifts in employment from the agricultural and manufacturing sectors to the service sector and from blue collar production work to white collar professional, technical and clerical work. For example, the share of workers in the manufacturing sector declined from 32% in 1990 to 27.15% in 2009 while that in the service sector rose from 46.32% to 68.87% within the same period. The share of workers employed as professionals rose from 5.15% of the overall workforce in 1990 to 8.88% in 2009, while those of technical workers and clerical workers rose from 11.63% to 21.10% and from 7.98% to 11.08%, respectively. Conversely, the share of production workers in the total workforce fell from 41.11% to 30.84% over the same period.

As workers have moved from manufacturing jobs to white collar and service jobs, the pattern of industrial relations in Taiwan has also changed. Human resource management (HRM) and high performance HRM practices have become more and more popular in Taiwan, while trade unions and collective agreements have been fading away. Available data show that the number of industrial unions has fallen from 1,354 units in 1990 to 982 units in 2007, and union density in terms of industrial union members as a percentage of the total labor force has declined from 31.0% to 17.4% within the same period. When the number of trade unions falls, the number of collective agreements is also reduced. Thus, while in 1990 there were a total of 283 collective agreements drawn up among industrial unions, this number declined to 282 in 1995 and to 236 in 2005, before falling sharply to 73 agreements in 2006 and 69 in 2007. Collective bargaining is rapidly becoming a thing of the past in Taiwan. This is somewhat understandable because it is a well known fact that white collar and knowledge workers are very difficult to organize since their employment, level of pay and benefits are determined on the basis of their individual performance, innovative and creative abilities, and not by

collective effort. However as some scholars point out, the decline in union influence is not good for a society, especially for a democratic society such as Taiwan, because a trade union is a form of social capital (Lipsky and Seeber, 2008) and it can therefore help to maintain a harmonious society.

It is the purpose of this paper to investigate whether trade unions, in spite of their no longer being able to play their traditional role of relying on collective actions and collective bargaining in improving their members' welfare, can play a different role by bridging employers and employees together in terms of helping employers to convert their businesses into green enterprises. It is argued that green enterprises are more competitive in the international market and able to offer green jobs which in most cases pay higher wages, with better working conditions and more stable jobs, therefore benefiting both employers and employees.

2. The concept of social capital

Social capital refers to the kinds of relationships or networks that facilitate cooperative and mutually supportive relations in communities or nations (Putnam 2000), and it is a valuable means of combating many of the social disorders inherent in modern societies, such as crime (Putnam 2000). Social capital is also the collective value of all 'social networks' and the inclinations that arise from these networks to do things for each other. Therefore social capital is important in building and maintaining a harmonious nation and a democratic society.

There are two main components of the concept of social capital: bonding social capital and bridging social capital. Bonding refers to the value assigned to social networks between homogeneous groups of people; and bridging refers to that of social networks between socially heterogeneous groups. Typical examples are that criminal gangs that create bonding social capital, while choirs and bowling clubs create bridging social capital (Putnam 2000). Bridging social capital has a host of other benefits for societies, governments, individuals and communities, and therefore people can live longer by joining an organization. Trade unions are organizations and networks for workers and therefore they are part of the social capital of a society, for they bridge employers and employees together and create benefits for both groups. By using this social capital concept Lipsky and Seeber (2008) have argued that the decline of the labor movement in the United States during the last two decades is precisely due to the decline of the network organizations of the labor movement (Lipsky and Seeber 2008).

3. Trade unions as social capital

One can argue that since collective effort is no longer required in most workplaces today, individual effort and especially the individual's ability in regard to innovation and creativity are required in most workplaces instead. Therefore, trade unions, which can no longer rely on collective effort and collective action as the main source of their strength as they have done in the past, today need instead to shift their emphasis toward relying on cooperation with their employers and helping to bring out the individual effort of their members while also increasing the competitiveness of their businesses so that the businesses are able to remain in the international market and thereby offer stable and well-paying jobs to their members. One of the cooperative efforts being mentioned is where employees work cooperatively with their employers by helping them to transform their businesses from those that produce polluting brown products into those manufacturing energy-saving and non-polluting green products. By helping their employers, especially those in small and medium-sized businesses, to equip their workers with knowledge and skills in the area of energy saving, carbon and waste reduction, and the manufacture of green products, they are in effect converting their members into green collar workers. As has been pointed out by many studies, green jobs usually pay higher wages than traditional jobs and offer better and cleaner working conditions and greater job stability. It is in this way that both employers and union members benefit from the unions' activities.

To see if this is feasible, in this paper we first look at green practices which employers are in the process of adopting and examine whether these practices are able to increase the competitiveness of their businesses. We then look at ways in which trade unions can help in assisting and persuading their employers, especially SMEs, to adopt green practices and thus transform their businesses into green businesses which offer better pay and provide more job stability (Davis, 1991; Shrivastava, 1996; Porter and Linde, 1995; Klassen and McLaughlin, 1996; Lau and Ragothaman, 1997).

4. Green enterprises in the 21st century

In recent years, nature has "fought back" and caused numerous major natural disasters. This has forced many countries to begin to seriously address the issues of the protection of the environment, energy conservation and carbon reduction, as well as sustainable development. In order to better protect the environment, these governments around the world have enacted many environmental protection laws and regulations. To respond to these newly-enacted laws and regulations and to enhance corporate image as well as fulfill social responsibilities, an increasing number of enterprises around the world are taking environmental factors into consideration when conducting their business activities, and some are investing heavily in environmental resources and the production of environmentally-friendly products. Others have transformed themselves into green enterprises. One can define a green enterprise as a business that actively engages into the following activities: 1. using recyclable materials to replace non-recyclable materials; 2.

adopting technologies which will not harm the environment or ecology but will raise people's standard of living; and 3. adopting production processes that generate a minimum amount of waste and pollution. Thus, as we have seen in recent years, many of the large businesses have set long-term goals to transform themselves into green businesses. For example, large consumer giants such as Kraft, Procter and Gamble, SC Johnson and Unilever have established long-term goals to turn their businesses into those that use 100 percent renewable energy for their factories, 100 percent renewable or recycled materials for all products and packages, and that send zero consumer or manufacturing waste to landfills. Some companies have converted their transportation fleet into electric vehicles and other types of energy saving transportation tools. Green marketing has been adopted by many companies to educate their consumers (State of Green Business Report 2011).

4.1 Level of corporate green practices

Table 1. Company green practices and their measurements

Green practices	Indicators
Adoption of green products and green technologies	Number of patents owned by the company related to green production or green technologies
Employees' knowledge and skills in environmental protection	Percentage of employees involved in environmental protection and related training programs
	Percentage of certificates owned by employees in environmental protection, e.g., wastewater treatment and air pollution control personnel certificates
Encouraging employees to apply their green knowledge and skills to daily operations	Percentage of employees involved in incentive programs related to the application of environmental protection knowledge to the company's daily operations, such as energy conservation and carbon reduction
Compilation of environmental regulations	Whether the company has passed various environmental certifications, e.g., ISO 14000 series, QC 080000
Green office	Whether the company has implemented office carbon reduction programs, such as: office waste reduction and recycling
Information transparency	Whether the company has released environment-related corporate social responsibility (CSR) reports
Relationship with stakeholders	Whether the company has given back to the local community and improved the quality of the local environment Whether the company has applied green philosophies and concepts to various corporate activities, e.g., evaluation of suppliers and business partners

How, then, does one measure the level of green practices of a business? Johnson (1998) proposed the use of the Balanced Scorecard concept; however, this concept needs to be

modified in order to fit the green business situation by adding some features which are more relevant to green practices and Taiwan's local situations. Thus we have modified Kaplan and Norton's (1992) balanced scorecard model and have included the green practices as well as the indicators of these variables in Table 1.

4.2 Green human capital

Green human capital refers to employees who possess environmental awareness, capability and skills. It is an asset specific to the enterprise. Employees must combine their past experience with new knowledge in green innovation and environmental management in order to be able to develop green measures that satisfy business requirements or produce green products that meet the needs of society. In this study we define green human capital as: knowledge, skills, abilities, attitudes and philosophies that are unique and in line with the strategic values of a green enterprise and capable of bringing positive environmental and business benefits to the enterprise. Such knowledge and experience must be unique to the company's green value and green strategies. Therefore, in this study we have adopted the two human capital characteristics developed by Lepak and Snell (1999, 2002), namely, strategic value and uniqueness, as a dimension to measure human capital. We have also designed a mailed questionnaire from which we can measure the amount of green human capital that the company has.

5. Relations between the level of corporate environmental practices, green human capital and enterprise competitiveness

Lepak and Snell (1999) pointed out that as the business environment changes, so does the uniqueness of the company's value of human capital and this results in a decline in the company's green human capital. Therefore, an enterprise must continue to invest in human capital to enhance its strategic value and uniqueness. Human capital investment activities refer to the assessment of current human capital, the confirmation of the current level of knowledge, skills and abilities within the organization, the gap compared with future requirements, as well as the implementation strategies to compensate for the lack of knowledge, skills and abilities (Koch and McGrath, 1996). Therefore, when an enterprise transitions from a non-green to a green future, it should also make up for the skills that are currently lacking. Wright, Dunford and Snell (2001) also considered that the cultivation of human capital by an enterprise should conform to the goals of corporate strategy, so that the talents will then be consistent with the direction and requirements of the enterprise and will provide the necessary competitive advantages. It follows that the longer an enterprise implements a particular strategy, the greater that the human capital accumulated in support of the strategy will become, and it is possible to cultivate specific human capital that can contribute competitive advantages only to that enterprise. In short, we can set our hypothesis as follows:

(H1): The degree of the corporate environmental practices has a positive effect on green human capital.

5.1 Green enterprises and corporate competitiveness

Hart (1997) believed that as an enterprise is faced with environmental challenges and resource utilization, the keys to maintaining a competitive advantage include the development of effective strategies to prevent pollution and to promote product management and sustainable development. Makower (2009) also pointed out that the green economy has solved the challenge of the balanced development of the environment and society and has created new opportunities and challenges for small and large enterprises in every industry sector.

Research by Klassen and McLaughlin (1996) has confirmed that environmental management can bring about better environmental performance to an enterprise and help it improve its future financial performance as well. Compliance with environmental standards seems to suggest higher costs for an enterprise. However, the reality is that this may provide incentives to employees to become innovative for the purpose of reducing product costs, so that the costs of pursuing a green environment will be reduced to a minimum due to the innovation, or that the value of the product may even be enhanced, leading to higher profits (Porter and Linde, 1995). Therefore we set our second hypothesis as follows:

(H2): The level of corporate environmental practices has a positive effect on corporate competitiveness

5.2 Green human capital and corporate competitiveness

Employee knowledge, skills and abilities can bring economic value to an organization, and the organization can improve its employee knowledge, skills and capabilities through investment in human capital as well as improve its productivity and performance (Snell and Dean, 1992; Roos et al., 1998). In addition, many studies have also confirmed that the more training an organization invests in its employees, the higher the employees' productivity. As a result, the organization's performance is improved and corporate competitiveness is enhanced (Black and Lynch, 1996;). Therefore, in an organization, the knowledge, skills and professional expertise of employees can create value for the organization.

In short, green human capital refers to the unique knowledge, skills, capabilities, attitudes and philosophies that are consistent with the strategic value of a green enterprise, and it also refers to the resources that can bring positive benefits to the environment.

Employees who possess green human capital can put their green innovation to good use and help the enterprise to enhance its competitiveness. For example, green employees can bring on board innovative environmental technologies and design products that save energy and resources related to production methods, manufacturing processes, production planning and management as well as other environmental solutions to lessen the impact of our daily activities on the environment and reduce pollution (Shrivastava, 1996). The third hypothesis of our study is:

(H3) Green human capital has a positive effect on corporate competitiveness

5.3 Mediation effect of green human capital

From the literature mentioned earlier in this paper, it can be deduced that enterprises that engage in the pursuit of environmental excellence and are proactive are able to raise their corporate competitiveness, but the path to green practices must follow green management measures, i.e., integrating the green philosophies of the enterprise into the organization, making adjustments to the organizational structure, employing innovative management tools, and internalizing environmental behaviors (Gladwin, 1993). When an organization implements its green management measures, it is also investing in green human capital from the employees' perspective. Cultivating employees' green philosophies via green values and visions, enhancing employees' green knowledge and skills via training programs, and adopting green policies and institutions make green behavior a natural part of the employees' daily work. Strategic human resource management theory states that the human capital investment made by an organization through various human resource management activities will improve the quality of human capital, and influence employee skills, their motivation and work structure, thereby changing the organization's performance. Chu-Chen Rosa Yeh (2006) in her studies aimed at human resources investment, human capital and organizational performance established that human resources investment affects the accumulation of the organization's human capital. She also showed that investment in human resources will exert a positive effect on organizational performance through the mediation effect of human capital. Therefore the fourth hypothesis of our study is:

(H4): The positive correlation between green human capital on the degree of a corporation's environmental practices and corporate competitiveness produces a mediation effect

6. Empirical Study

6.1 The sample

In this study, 657 enterprises were sampled from the largest 1,000 Taiwanese manufacturers as identified and ranked in the May 2009 issue of Commonwealth Magazine in Taiwan, and electronic and paper-based questionnaires were sent to these companies. A total of 147 usable responses were returned. The questionnaire data were analyzed using hierarchical regression to determine the relationship between the extent of corporate environmental (“green”) practices and their competitiveness, as well as the role that green human capital plays.

The subjects of this study are the largest 1,000 Taiwanese manufacturers having their own R&D divisions, as identified and ranked in the May 2009 issue of Commonwealth Magazine in Taiwan. Both electronic and paper-based questionnaires were sent to these companies and supervisors in human resource departments were asked to complete them. A total of 657 questionnaires were issued and 147 were returned. After discarding 5 invalid questionnaires with incomplete information, the effective response rate was determined to be 22.37%. Table 4 shows the characteristics of the sample data collected.

Table 2. Characteristics of sample (N = 147)

Variable	Category	Sample size	Percentage
Capital	below NT\$5 billion	108	73.5%
	NT\$5.001 billion to NT\$10 billion	19	12.9%
	over NT\$10 billion	20	13.6%
Ownership structure	Taiwan	128	87.1%
	Foreign	19	12.9%
No. of employees	less than 1,000	65	44.2%
	1,001 to 2,000	29	19.7%
	2001 to 5000	20	13.7%
	over 5,000	33	22.4%
No. of years in business	less than 20 years	55	37.4%
	21 to 40 years	64	43.5%
	over 40 years	28	19.1%

6.2 Measurement

(1) Measurement of the level of corporate environmental practices

In this study, a list of 11 indicators has been compiled to measure the degree of corporate environmental practices. Based on the level of participation implied by each indicator and the actual number of completed items, each question will be given a score of up to 5 points. The

aggregate of these scores will be used to measure the degree to which each enterprise is committed to green practices, and the higher the score, the higher the level of commitment.

(2) Measure of green human capital

In this study, the text of the statements in the questionnaire has been revised to comply with the essence and content of green human capital based on the human resources scale developed by Lepak and Snell (2002). There are 12 items that deal with the measurement of human capital strategic values and 10 items that deal with human capital uniqueness in the original questionnaire. A Likert 5-point scale is employed, but in this study the questionnaire has been adjusted to a 4-point scale, with a higher score indicating a higher level of agreement. Table 5 presents the results of the reliability and validity analyses.

(3) Measurement of corporate competitiveness

In this study, the questionnaire used in the survey of corporate competitiveness in the study on green intellectual capital and the competitive advantages of firms in Yu-Shan Chen (2008) has been adopted. There were 11 items in the original questionnaire using a Likert 5-point scale. In this study, the items were modified and two additional items were added to make a total 13 items. The questionnaire was also adjusted to a 4-point scale, with a higher score indicating a higher degree of agreement, as shown in Table 3.

Table 3. Reliability and validity analyses of various variables

Variables	No. of items used in measurement	Cronbach's α	Cumulative explained variance
Strategic value of green human capital	10	.920	29.174%
Uniqueness of green human capital	10	.917	55.684%
Corporate competitiveness	12	.902	48.731%

7. Empirical Results

Table 4 shows the mean and standard deviation of the variables under study as well as

the results of related analysis. Hierarchical regression analysis is employed to analyze the data in order to test the hypothesis. The results are shown in Table 4.

In this study, we adopt the viewpoint of Baron and Kenny (1986) to verify whether the variables exhibit mediating or intervening effects. Therefore we will verify the predictive effects of the following in the order indicated: independent variables on intervening variables, independent variables on dependent variables, and intervening variables on dependent variables. Then we will add both independent and intervening variables to the regression model at the same time to predict the dependent variables. At this point, the intervening variables should exhibit a significant predictive effect, while the predictive ability of the independent variables will decrease significantly or become completely insignificant, which indicates that these variables exhibit a partial mediation effect or full mediation effect.

Table 4. Correlation analysis of key variables

	Mean	Standard deviation	A	B	C
A. Degree of corporate green practices	2.26	.93	1		
B. Green human capital	2.92	.40	.404**	1	
C. Corporate competitiveness	2.79	.45	.274**	.515**	1

* $p < .05$ ** $p < .01$

To rule out other interfering factors, we put the capital, ownership structure, number of years in business and number of employees into the control variables; the capital, number of years in business and number of employees are all continuous variables, while the ownership structure is a dummy variable, taking the value of either “Taiwan “ or “Foreign” (Taiwan: 0; Foreign: 1).

7.1 Correlation of the level of corporate environmental practices and green human capital

Model 1 in Table 5 provides an analysis of the effect of the degree of corporate green practices on green human capital, under the condition where the control variables are constrained. The results show that the overall variability of the regression model that can be explained is 14.4% ($\Delta R^2 = 0.144$, F change = 22.972, $p = .00$), and the degree of corporate green practices has a significant predictive power on green human capital ($\beta = 0.408$, $p = .00$). Thus Hypothesis 1 is accepted.

7.2 Correlation of the level of corporate environmental practices and the corporation's competitiveness

The results of Model 2 show that, with the control variables constrained, the degree of corporate green practices and a corporation's competitiveness are both significant in providing a predictive effect ($\beta = 0.287, p < .01$), while the explained variance of the overall regression model is 5.1% ($\Delta R^2 = 0.051, F \text{ change} = 10.273, p < .01$). Hypothesis 2 is thus accepted.

7.3 Correlation of green human capital and the corporation's competitiveness:

The results of Model 3 show that, with the control variables constrained, the explained variance of the overall regression model is 24.7% ($\Delta R^2 = 0.247, F \text{ change} = 49.769, p = .00$), and green human capital has a significant predictive effect on the corporation's competitiveness ($\beta = 0.517, p = .00$). Hypothesis 3 is accepted.

7.4 Mediation effects of green human capital:

The results of Model 4 show that green human capital has a significant predictive effect on the corporation's competitiveness ($\beta = 0.486, p = .00$), but the predictive effect of the degree of corporate green practices on the corporation's competitiveness has decreased and fails to reach the significant level ($\beta = 0.089, p = .303$). It can be concluded that green human capital has full mediation effects on the degree of corporate green practices as well as on the corporation's competitiveness, and thus Hypothesis 4 is accepted.

Table 5. Results of the regression analysis on the degree of corporate green practices, green human capital and the corporation's competitiveness

	Green human capital		Corporation's competitiveness	
	Model 1	Model 2	Model 3	Model 4
Control variables				
Capital	-.06	-.096	-.049	-.067
Ownership structure	-.057	.023	.06	.051
No. of years in business	.063	-.02	-.055	-.051
No. of employees	.057	.046	.038	.018
Dependent variables / intervening variables				
Degree of corporate green practices	.408**	.287**		.089
Green human capital (mediation)			.517**	.486**
R ²	.173	.083	.273	.279
Adjusted R ²	.144	.051	.247	.248
R ² variation	.135	.067	.257	.195
F value	5.907**	2.561*	10.592**	9.01**
F variation	22.972**	10.273**	49.769**	37.901**

Note: Figures in the table are the standardized β coefficients

* $p < .05$ ** $p < .01$

8. Discussion and Conclusion

The green economy and green enterprises have only very recently become a topic of interest in Taiwan. Therefore, many Taiwanese enterprises have not yet begun the promotion of green measures or have started only very limited practices, which have resulted in many of the companies surveyed being unable to respond to our questionnaire. In addition, green human capital is a newly proposed concept and has yet to be widely explored or applied in enterprises. Coupled with the fact that businesses have only a short history of green practices, this means that the level of difficulty in answering the questionnaire is increased given the fact that employees have limited understanding and observation of green human capital. This may result in lower survey accuracy in addition to the questionnaire's low response rate. Regardless of these shortcomings, we can come to the conclusion that adopting more green practices can in fact help the company to increase its competitiveness. We can also infer that most of the SMEs are small in size and lack the knowledge and skills and the economies of scale in converting themselves into green businesses, and therefore trade unions can play a positive role in this area by educating employers as well as persuading them to adopt more green practices and thereby convert themselves into green enterprises. Trade unions can also do the following to convert their members to green collar workers and thus facilitate the

company's move to green business and eventually provide better pay and more stable jobs to their members. These actions include:

(1) Enhancing employees' green knowledge:

Trade unions should promote the importance of environmental protection among employees by providing environment-related training and fostering the acquisition of knowledge, skills and abilities required for the research and development, design, production, marketing and even management of green products in order to allow employees to be green innovators, thereby enabling the enterprise to enhance resource productivity and compensate for the costs of maintaining an environmentally friendly operation via green innovation. Moreover, corporations that are pioneers in green innovation will gain the advantage of being early adopters and will be able to charge higher prices for green products, improve their corporate image, and even sell their environmental technologies and services, as well as develop new markets and gain competitive advantages (Porter and Linde, 1995).

(2) Encouraging employees' voluntary green innovation:

Porter and Linde (1995) proposed that the two main areas of environmental innovation are: (1) new technologies and new practices capable of minimizing the cost of cleaning up instances of pollution as they occur; (2) focusing on the root cause of pollution and giving top priority to the improvement of resource productivity, thereby bringing more benefits than previously with these innovative techniques. Therefore, when employees are able to apply green human capital and take the initiative to improve existing products, pollution issues will be addressed before they occur. This enables the enterprise to produce green products that meet customer requirements, and help it to remain a step ahead of its competitors, allow it to expand its market with these products and to become more competitive.

8.3 Strengthen employees' green values:

Employees will take the initiative to improve existing products and to build up their own green human capital if the enterprise is able to change their attitudes and ideas. A company can incorporate a benefit system that provides employees with the incentives to achieve the goals of environmental protection, energy conservation and carbon reduction that will strengthen their green values. Employees will pay closer attention to environment-related issues and will participate in active rather than passive learning. The enterprise will improve its corporate image and add to its competitiveness.

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