The Influence of Talent Management on Sustainable Competitive Advantage of Small and Medium Sized Establishments

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ABSTRACT: This research provides empirical evidence on the links between talent management and competitive advantage. The evidence presented in this research recommends that firms consider business models that invest in talent management. Proportional odds ordered logistic regression models are used to test hypotheses on the influence of talent management on objective measures of the outcomes of a firm's sustainable competitive advantage. The results are both statistically significant and strong.

Introduction

Organizational resources, human resources, and physical resources are three types of capital resources that can be identified as the sources of a business competitive advantage. Examples of a firm's organizational capital resources are organizational planning and control and a firm's organizational structure. Examples of a firm's human capital are the knowledge of a firm's employees coupled with their judgment and skills, tacit knowledge and intellectual property. (Barney & Wright, 1998). And examples of a firm's physical capital resources are a firm's buildings, plants, equipment and finances. Talent management, organizational resources and human resources compose the organizational culture of a firm (Barney & Wright, 1998). This research contains an empirical analysis of the link between talent management and a business establishment's sustainable competitive advantage.

The objective of this research is to fill existing gaps in the business literature by providing an analysis of the relationship between talent management and objective measures of the outcomes of sustainable competitive advantage. The percentage of annual sales derived from new products introduced in the past three years, the percentage of reduction in the total value of inventory throughout the supply chain for the primary product over the last three years, and the percentage improvement in productivity over the past three years are used to measure the outcomes of the sustainable competitive advantage. These three dependent variables are used because it is assumed that businesses with improved productivity, reduced inventory levels, and sales from new products will also be businesses with higher profits and improved probabilities of survival over time, which are the ultimate measures of competitive advantage.

Talent management is used as an independent variable because it is assumed that businesses with high levels of talent management will also be businesses with higher levels of involvement, sense of ownership and responsibility. (Denison, 1990). Talent management is an aspect of organizational culture that captures one source of competitive advantage that is human resources. The links between the three observed dependent variables and profitability and firm survival provide the logic for the model of competitive advantage that is used in this research.

This conceptual framework includes three dependent variables and one independent variable, forming three potential hypotheses that establish the potential association of talent management with objective measures of the outcomes of a firm's sustainable competitive advantage.

The ability to imitate the distinctive competencies of successful firms presents a threat to established SMEs, pushing them to rethink their business models which in turn may reinvigorate their competitive advantage. Maintaining existing advantage is difficult (Stalk, 1988), because its sources may be imitated by new industry entrants. Competitive advantage is at the heart of a firm's performance in competitive markets (Porter, 1985) yet, SMEs in particular have difficulty in sustaining their sources of competitive advantage (Van Gils, 2000). Competitive advantage is defined as being sustainable if competitors are unable to imitate the source of advantage or if no one conceives of a better offering. Barney (2008)

The influence of talent management on an establishment's performance is examined using the theory of competitive advantage. This research develops a conceptual framework that associates talent management with three objective measures of the outcomes of a firm's sustainable competitive advantage. The cross-sectional Wisconsin Next Generation Manufacturing Study survey that was developed and administered by the Manufacturing Performance Institute (MPI) in Wisconsin, is used and the hypotheses are tested with proportional odds logistic regression models.

This research begins with an introduction, where the objectives and contribution of the research are described. A description of relevant studies, theoretical models, research variables, a value chain model and a suggested framework that illustrates the interactions between the dependent and the independent variables follow in the next section. The research question and three hypotheses are then described. The statistical models in this section test the hypothesized relationships between talent management and the outcomes of a firm's sustainable competitive advantage. The variables are also defined and operationalized in this section. The research ends with a discussion of the results followed by the conclusions.

Theoretical Model

Talent Management

Lewis and Heckman (2006) identify three streams of thought around the concept of talent management. The first stream substitutes talent management for human resources management, the second stream focuses on the projection of staffing needs and managing employee progression, the third stream focuses on managing the performers and the players as the talented people. A fourth stream could also be identified that focuses on the identification of strategic

positions. (Collings and Mellahi, 2009) For the purpose of this research, talent management is defined as a mission driven process that includes all the activities that are required to ensure that an organization has the required human capital to enable it achieve its strategic goals.

This research uses talent management as an independent variable. To proxy the aspect of talent management, this independent variable is measured by the percentage of employees dedicated to assessing and upgrading the organization's talent pool.

Competitive Advantage

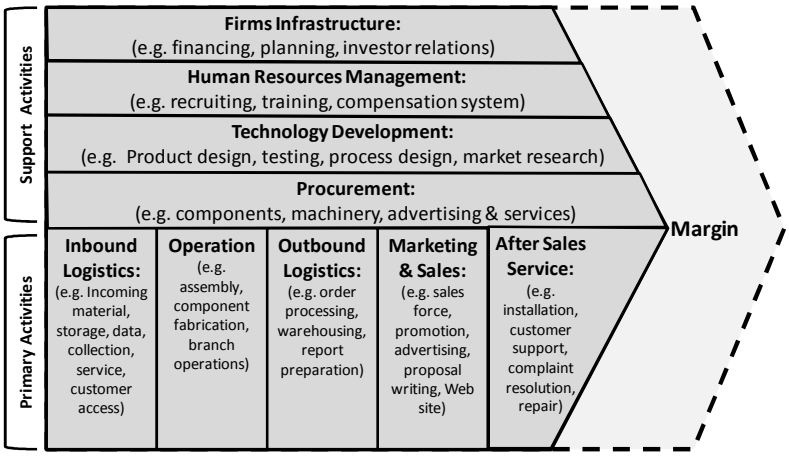
This section defines competitive advantage. Organizational resources, human resources, and physical resources are three types of capital resources that can be identified as the sources of a business competitive advantage. Examples of a firm's organizational capital resources are organizational planning and control and a firm's organizational structure. Examples of a firm's human capital are the knowledge of a firm's employees coupled with their judgment and skills, tacit knowledge and intellectual property. (Barney & Wright, 1998). And examples of a firm's physical capital resources are a firm's buildings, plants, equipment and finances. Talent management, organizational resources and human resources compose the organizational culture of a firm (Barney & Wright, 1998).

Stalk (1988) suggests that maintaining competitive advantage is a constantly moving target and the source of competitive advantage will shift over time. The term competitive advantage is used to describe the source of a firm's ability to win business and out-perform competitors at a point in time. Companies must be flexible in order to respond rapidly to competitive and market changes because rivals can quickly copy any changes in market position or strategies (Porter, 1996). Stevenson (2009) defines competitive advantage as a firm's effectiveness in using organizational resources to satisfy customers' demand when compared to competitors. Barney (2008) defines competitive advantage as the ability to create more economic value than competitors and he distinguishes between two types of competitive advantage: temporary and sustainable competitive advantage. Competitive advantage typically results in high profits. But profits attract competition, and competition limits the duration of competitive advantage in most cases, therefore most competitive advantage is temporary (Barney, 2008). On the other hand, if competitors are unable to imitate the source of advantage or if no one conceives of a better offering then competitive advantages are sustainable (Barney, 2008).

Competitive advantage must reside in a firm's value chain that is composed of primary business activities and support business activities and is displayed in Figure 1. Inbound logistics, operations, outbound logistics, marketing and sales and after sales service are examples of primary business activities. Firm infrastructure, human resources management, technology development and procurement are examples of support business activities.

The value chain is entrenched in a firm's value system which includes: suppliers, buyers, and distribution channels. and the activities inside the value chain are interlinked and this linkage creates interdependencies between the firm and its external environment. Competitive advantage depends on how well a firm coordinates the entire value system.

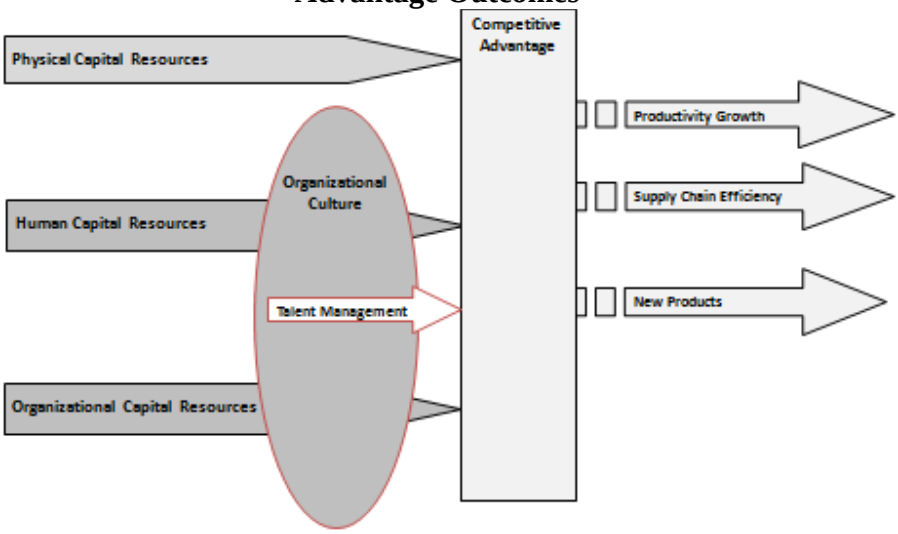
Figure 1: The Value Chain.



(Source: Porter, 2006).

Figure 2 illustrates the proposed model of the interactions between talent management and competitive advantage outcomes that is tested in this research.

Figure 2: The Interactions Between Talent Management & Sustainable Competitive Advantage Outcomes



Three objective measures of the hypothesized outcomes produced by sustainable competitive advantage are used as dependent variables in this research: 1) productivity growth: measured by the percentage improvement in productivity over the previous three years, 2) supply chain efficiency: measured by the percentage of reduction in the total value of inventory throughout the supply chain for the primary product over the previous three years, and 3) new products: measured by the percentage of annual sales derived from new products introduced in the previous three years. It is assumed that higher margins are associated with new products.

Control Variables

Porter (2006) maps the relationship between a firm's operations in Figure 1 with emissions and waste, therefore, the establishment's environmental awareness, or green, is used as a control variable. This is measured by the percentage of the workforce dedicated to reducing energy, or emissions in operations. Storey (1994) shows that firm characteristics such as size, age, and sector are important factors that influence SMEs' success. Based on Storey (1994), the size of the business establishment is used as a control variable. The size of establishment is measured by the number of full time employees. A small and medium sized establishment is defined as one that employs 500 or fewer employees as identified in the MPI survey. The age of the establishment is measured by the number of years the establishment has been in operation. The industry that the firm is a part of is also entered into the equation to control for industry-specific fixed effects. This is done with the establishment's North American Industry Classification System (NAICS) assignment.

The dependent variables, independent variables, control variables and theoretical model, have been defined in this section. The hypothesized relationships between talent management and the objective measures of the outcomes from competitive advantage are also discussed in this section. The next section provides the research question that explores this relationship and research hypotheses. Table I describes the definitions of research variables and their ordinal scales.

Research Question and Hypotheses

Research Question

The primary research question in this study explores the influence of talent management on sustainable competitive advantage (SCA). As described in previous sections three resources are sources of competitive advantage: organizational resources, human resources, and physical resources (see Figure 2 above). The research question (RQ) addressed in this chapter is: Does talent management affect the competitive advantage of an SME?

Hypotheses

As noted above, Denison (1990) identified four basic components of organizational culture that are translated into four hypotheses about the connection between culture and performance: 1) the consistency hypothesis, 2) the mission hypothesis, 3) the involvement/participation hypothesis and 4) the adaptability hypothesis. The involvement and consistency hypotheses test the associations between employee participation, training and talent management with the organization's performance.

Talent management is measured by the percentage of employees dedicated to assessing and upgrading the organization's talent pool. This independent variable is used because it is assumed that businesses with high levels of talent management will also be businesses with higher levels of involvement, sense of ownership and responsibility. Involvement and ownership are key measures of organizational culture. Ownership creates a greater organizational commitment, a lesser overt control system and therefore improves business effectiveness (Denison, 1990).

Table I: Definitions Of Variables & Ordinal Scales.

Competitive Advantage Dependent Variables	$PRODUCTIVITYGROWTH_i$: Ordered dependent variable, defined as the percentage improvement in productivity over the past three years, and is scaled on a five level ordinal scale: level one being 0-25%, level two 26-50%, level three 51-75%, level four 76-99%, and level five >100%.
	$SUPPLYCHAIN_i$: Ordered dependent variable, defined as the percentage of reduction in the total value of inventory throughout the supply chain for the primary product over the last three years, and is scaled on a four level ordinal scale: level one being <10%, level two 10-25%, level three 26-50%, and level four >50%.
	$NEWPRODUCTS_i$: Ordered dependent variable, defined as the percentage of annual sales derived from new products introduced in the past three years, and is scaled on a four level ordinal scale: level one being <5%, level two 5-25%, level three 26-50%, and level four >50%.
Independent Variable	$TALENTMGMT_i$: Independent variable, defined as the percentage of employees dedicated to assessing and upgrading the organization's talent pool, and is scaled on a four level ordinal scale: level one being <1%, level two 1-5%, level three 6-10%, and level four >10%.
Control Variables	$PARTICIPATION_i$: Independent variable, defined as the percentage of employees regularly participating in empowered work teams (i.e., make decisions without supervisor approval), and is scaled on a five level ordinal scale: level one being <25%, level two 25-50%, level three 51-75%, level four 76-90%, and level five >90%.
	$TRAINING_i$: Independent variable, defined as the number of training hours devoted annually to each employee, and is scaled on a four level ordinal scale: level one being ≤8 hours, level two 9-20, level three 21-40, and level four >40 hours.
	$\log(SIZE_i)$: Control variable, defined as the log of the number of full time employees.
	$log(\mathrm{AGE}_i)$: Control variable, defined as the log of the number of years the organization has been in operation.
	$GREEN_i$: Control variable, defined as the percentage of workforce dedicated to reducing energy, or emissions in operations.
	$NAICS_i$: Control variable, defined as the North American Industry Classification System (NAICS).
	ε_i: Statistical Error.

Three objective measures of the outcomes from an establishment's competitive advantage are used as this study's dependent variables: 1) productivity growth: measured by the percentage improvement in productivity over the past three years , 2) supply chain efficiency: measured by the percentage of reduction in the total value of inventory throughout the supply chain for the primary product over the last three years , and 3) new products: measured by the percentage of annual sales derived from new products introduced in the past three years. These three dependent variables are used because it is assumed that businesses with improved productivity, reduced inventory levels, and proportionately large sales from new products will also be businesses with higher profits and improved probabilities of survival over time, these are assumed to be the ultimate measures of the success of competitive advantage.

Based on the hypotheses developed by Denison about the connection between organizational culture and performance it is reasonable to propose a set of hypotheses that explore the effect of talent management on objective measures of the outcomes from sustainable competitive advantage. This research defines three dependent variables and one independent variable. The research hypotheses are organized into one set of questions that are given in Table II, The dependent variables are defined in Table I. The set of hypotheses in Table II include Research Hypotheses RH1, RH2 and RH3. These three hypotheses explore the effect of talent management on the three dependent variables: productivity growth, supply chain efficiency and new products.

Table II: Hypotheses Sets For The Independent Variable Talent Management.

Independent Variable (Talent Management)	RH1	H_0	*The percentage of employees dedicated to assessing and upgrading the organization's talent pool has no effect on the percentage improvement in productivity over the past three years.*
		H_1	*The percentage of employees dedicated to assessing and upgrading the organization's talent pool does affect the percentage improvement in productivity over the past three years.*
	RH2	H_0	*The percentage of employees dedicated to assessing and upgrading the organization's talent pool has no effect on the percentage of reduction in the total value of inventory throughout the supply chain for the primary product over the last three years.*
		H_1	*The percentage of employees dedicated to assessing and upgrading the organization's talent pool does affect the percentage of reduction in the total value of inventory throughout the supply chain for the primary product over the last three years.*
	RH3	H_0	*The percentage of employees dedicated to assessing and upgrading the organization's talent pool has no effect on the percentage of annual sales derived from new products introduced in the past three years.*
		H_1	*The percentage of employees dedicated to assessing and upgrading the organization's talent pool does affect the percentage of annual sales derived from new products introduced in the past three years.*

This set of hypotheses are tested using proportional odds ordered logistic regression models as explained in the next section.

Research Model and Data

The statistical models used for testing these three sets of hypotheses are structured according to the following equations, where $f(\,)$ is used to signify the proportional odds logistic regression function:

Model 1:

$$PRODUCTIVITYGROWTH_i = f(\alpha + \beta_1 PARTICIPATION_i + \beta_2 TRAINING_i + \beta_3 TALENTMGMT_i + \beta_4 \log(SIZE_i) + \beta_5 log(AGE_i) + \beta_6 GREEN_i + \beta_7 NAICS_i + \varepsilon_i)$$

Model 2:

$$SUPPLYCHAIN_i = f(\alpha + \beta_1 PARTICIPATION_i + \beta_2 TRAINING_i + \beta_3 TALENTMGMT_i + \beta_4 \log(SIZE_i) + \beta_5 log(AGE_i) + \beta_6 GREEN_i + \beta_7 NAICS_i + \varepsilon_i)$$

Model 3:

$$NEWPRODUCTS_i = f(\alpha + \beta_1 PARTICIPATION_i + \beta_2 TRAINING_i + \beta_3 TALENTMGMT_i + \beta_4 \log(SIZE_i) + \beta_5 log(AGE_i) + \beta_6 GREEN_i + \beta_7 NAICS_i + \varepsilon_i)$$

The first model explores the association between talent management and percentage improvement in productivity over the past three years. The second model explores the association between talent management and percentage reduction in the total value of inventory throughout the supply chain for the primary product over the last three years. The third model explores the association between talent management and percentage of annual sales derived from new products introduced in the past three years. Each of the three statistical models is tested under different conditions. Each model is tested using the North American Industry Classification System (NAICS) code under different fixed effects assumptions. Table I defines the variables used in these statistical models.

Twenty manufacturing sectors represented in the sample, based on the NAICS 2007 classification of the manufacturing sector. The distribution of SMEs in the sample is roughly parallel to the distribution of SMEs in the universe but it is slightly skewed in some sectors. However, the NAICS fixed effects variables correct for biases introduced by the skewed distributions of establishments by industry in the sample. Therefore, the sample is concluded to be roughly parallel to the universe, assuming that the relationship between dependent and independent variables is constant across industries.

Data Source and Method

The data are from the Wisconsin Next Generation Manufacturing Survey of manufacturing establishments in Wisconsin conducted by the MPI for the Wisconsin Manufacturing Extension Partnership (WMEP) during 2008. The survey instrument was administered during 2008. The purpose of the MPI survey was to identify best management practices in the state's manufacturing establishments. The universe of the study was all manufacturing establishments in Wisconsin. The sample size is 492 establishments representing a 6% of the universe.

The dependent variables are ordinal variables, therefore, proportional odds logistic regression models are used for the statistical analysis. Validation of the appropriateness of the proportional odds ordered logistic regression model is required (Vani, 2001). The proportional odds assumption is statistically tested using a Chi Square test. The ordered logistic model assumes that model errors are logistically distributed, as compared to ordered probit models where model

errors are assumed to be normally distributed. Either model can be used for our tests. However, the ordered logistic model was selected because its results are easier to interpret than ordered probit models.

The goodness of fit of the estimated statistical models is measured using the Akaike Information Criterion (AIC) statistic where AIC = 2k – 2 ln(L), where: L is the maximized value of the likelihood function of the estimated model and k is the number of parameters in the statistical models (Vani, 2001). AIC is a model selection tool where the model with the lowest AIC value is determined to be the best. A low AIC value is interpreted as identifying the model with the lowest level of information inaccuracy. Although ordered logistic regression models do not have an R^2 value as an overall gauge of the model's goodness of fit, they do have an analogous measure, the PseudoR^2. The PseudoR^2 is calculated using the following formula:

$$\text{PseudoR}^2 = 1 - (\ln L_{(\text{Multinomial})} / \ln L_{(\text{Ordered})})$$

Where: $\ln L_{(\text{Multinomial})}$ is the loglikelihood value of the multinomial regression model and $\ln L_{(\text{Ordered})}$ is the loglikelihood value of the ordered logistic regression model. The PseudoR^2 is a rough indicator of the goodness of fit, where a value equal to zero means that all coefficients are zero and a value equal or close to 1 means that the model is very good (Vani, 2001).

Results and Discussion

Before the results are discussed in this section, validation of the appropriateness of the proportional odds ordered logistic regression model is required (Vani, 2001). The proportional odds assumption holds for all the models tested. The results for the small and medium sized establishments (SMEs) models are generally superior to the results for the models that include observations on establishments of all sizes. The lowest AIC result is for Model 2 where the AIC = 869. This means that the goodness of fit is best for the statistical model testing the regression of the ordered dependent variable supply chain that include the 4-digit NAICS fixed effects variables and where the sample is restricted to SMEs.

The research results highlight a strong positive association between talent management and productivity growth, at the 1% critical level. This means that the percentage of employees dedicated to assessing and upgrading the organization's talent pool is strongly associated with the percentage improvement in productivity over the past three years. The dummy variable talent management at level four, with more than 10% of the establishment's employees dedicated to assessing and upgrading the organization’s talent pool, is positive and statistically significant at the 1% critical level. The association of talent management with productivity growth at the 1% critical level is interpreted as holding all else constant when more than ten percent of employees are dedicated to assessing and upgrading their organization’s talent pool, then the odds of improving productivity are multiplied by 3.853 times what they are when less than one percent of employees are dedicated to assessing and upgrading their organization’s talent pool. This is a very strong indicator of the importance of talent management in its effects on increasing productivity growth.

As the percentage dedicated to improving the organization's talent pool gets larger, the difference from the omitted dummy variable talent management 1 in the regression model also

gets larger, where the independent variables are scaled on a four or five-level ordinal scale. This provides additional evidence of the strong link between the increase in the percentage of employees dedicated to improving the talent pool and between productivity growth. There is evidence of a relationship between the talent management variable and the competitive advantage outcomes. There is one strong relationship that is significant at the 1% critical level, and one relationship that is significant at the 10% critical level. The results show that the percentage of employees dedicated to assessing and upgrading the organization's talent pool is only associated with the productivity growth variable, however, this is a strong association that is significant at the 1% critical level.

The second model explores the association of talent management with the percentage reduction in the total value of inventory throughout the supply chain for the primary product over the last three years. Model three explores the association of talent management with the percent of annual sales derived from new products introduced in the past three years. The consistency of the results is evident when the statistical models tested are examined. The models were tested with different NAICS code fixed effects using three-digit, four-digit and five-digit NAICS fixed effects. The model restricted to SME size and four-digit NAICS defined industry dummy variables to capture industry fixed effects proved to be the superior model, having the lowest AIC value of 869. The SME models show higher t-values and larger odd ratios compared to the other models that included the full sample of all manufacturing establishments; manufacturing establishments of all sizes.

Talent management has a strong association with productivity growth. The economic and practical interpretation of the statistical analysis discussed above highlights the importance of talent management as a source of competitive advantage. Therefore, business establishments and top managers are advised to invest in managing their organizational talent pool. Furthermore, it is also evident that the relationship between talent management and the objective measures of the outcomes of sustainable competitive advantage is stronger when the sample is restricted to SMEs. This is an empirical result. As noted above, there are differences between SMEs and establishments of all sizes. However, there is no information to explain why. The association of talent management with new products is very weak, almost non-existent.

Supply chain efficiency improves as inventory levels are decreased throughout the supply chain (Stevenson, 2009). A supply chain includes all the internal and external activities and facilities that are related to the production and distribution of a product. Talent management can only be applied to the internal portions of a supply chain and, therefore, may not have a strong association with a supply chain that extends to include external activities and facilities. Unused human skill and knowledge within an establishment is a competitive disadvantage. Talent management is a long-term strategy, and a difficult asset to cultivate (Denison, 1990) however, this research shows that it is well worth the effort.

Table III: Summary of the Proportional Odds Logistic Regressions Results.

		p-value		
		Model 1	Model 2	Model 3
		Dependent Variable		
		PRODUCTIVITYGROWTH	SUPPLYCHAIN	NEWPRODUCTS
Independent Variable	TALENTMGMT	3.260***		1.790*
	df	108	107	107
	AIC	1069	869	1119
	Pseudo R^2	0.2717	0.2280	0.2609
Proportional Odds Test *"Pchisq"*		0.9997	0.9973	0.8644

*significant at the 0.10 confidence level **significant at the 0.05 confidence level ***significant at the 0.01 confidence level. N=492

Conclusion

Talent management forms a basis for creating a framework for understanding and, more importantly for investing in a firm's sustainable competitive advantage. This study provides empirical evidence about the link between talent management and objective measures of the outcomes from sustainable competitive advantage. This study shows that talent management has a strong association with productivity growth and with the percentage of annual sales derived from new products.

This research leads to recommendations that managers increase the percentage of employees

Table IV: Summary of the Results of the N4digSME Models.

	Model 1 Dependent Variable (PRODUCTIVITYGROWTH)		Model 2 Dependent Variable (SUPPLYCHAIN)		Model 3 Dependent Variable (NEWPRODUCTS)	
Variable Name	Value	EXP(Coef)	Value	EXP(Coef)	Value	EXP(Coef)
	Std. Error	t value	Std. Error	t value	Std. Error	t value
PARTICIPATION2	0.676	1.965	0.502	1.651	-0.109	0.897
	0.281	2.400**	0.291	1.720*	0.267	-0.409
PARTICIPATION3	0.208	1.231	0.510	1.665	-0.060	0.942
	0.347	0.599	0.361	1.410	0.341	-0.176
PARTICIPATION4	1.041	2.833	0.338	1.402	-0.419	0.658
	0.428	2.440**	0.459	0.737	0.407	-1.030
PARTICIPATION5	0.529	1.697	-0.770	0.463	-0.054	0.947
	0.600	0.881	0.682	-1.130	0.578	-0.094
TRAINING2	0.642	1.901	0.953	2.594	0.059	1.061
	0.292	2.200**	0.316	3.020***	0.277	0.213
TRAINING3	0.714	2.041	1.300	3.671	0.491	1.633
	0.361	1.977*	0.385	3.380***	0.347	1.410
TRAINING4	0.881	2.413	1.035	2.816	0.987	2.683
	0.428	2.060**	0.477	2.170**	0.413	2.390**
TALENTMGMT2	0.530	1.699	-0.081	0.922	0.335	1.397
	0.302	1.750*	0.310	-0.262	0.288	1.160
TALENTMGMT3	1.283	3.606	0.281	1.325	0.674	1.962
	0.394	3.260***	0.406	0.692	0.377	1.790*
TALENTMGMT4	1.349	3.853	-0.744	0.475	0.113	1.119
	0.473	2.850***	0.604	-1.230	0.482	0.234

*significant at the .10 confidence level **significant at the 0.05 confidence level ***significant at the 0.01 confidence level. N=492

dedicated to assessing and upgrading the organization's talent pool. The evidence presented in this research recommends that firms consider business models that invest in talent management.

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