Span of Control in Teamwork and Organization Structure

KATARINA REMENOVA[1], ZUZANA SKORKOVA[2] and NADEZDA JANKELOVA[3]

[1] Assistant Professor, Department of Management, Faculty of Business Management, University of Economics, Bratislava, Slovakia, E-mail: katarina.remenova@euba.sk

[2] Assistant Professor, Department of Management, Faculty of Business Management, University of Economics, Bratislava, Slovakia, E-mail: zuzana.skorkova@euba.sk

[3] Associate Professor Department of Management, Faculty of Business Management, University of Economics, Bratislava, Slovakia, E-mail: nadezda.jankelova@euba.sk

ARTICLE INFO

ABSTRACT

The span of control expresses how many subordinates correspond to one manager, while determined by many factors and unable to be expanded indefinitely. The study monitors the impact of determinants, like the functional area of control, the level of management, the duration of managerial position, the age of the manager, the size and composition of the team. The results of non-parametric testing (Chi-Square Test of Independence) and rates of association between variables (using Cramér's V and Phi coefficient and for ordinal variables, Kendall's tau-b, Goodman-Kruskal's Gamma, Kendall's tau-c and Somers' d) indicate that the team size is not related to the level of management, which does not confirm the assumption that the largest teams work at the lowest management level and vice versa, that the team leader at the top level is in charge of the smallest number of people. Instead the size of the team depends on the functional area of control. The assumption that increasing age, and so increasing experience also increases the size of the team, has not been confirmed. However, the fact that the manager works longer in the leading position has been confirmed. With the current manner of managing an organization, the age of the manager is the weak indicator of the duration of the managerial position.

INTRODUCTION

The management and development of qualified teams is one of the challenging tasks of modern management, mainly in building team intelligence and team dynamic, which applies to operational forces within all team members (Eubanks et al., 2016, Klug – Bagrow, 2016). A team's own dynamic dominates within each one, but varying in intensity for different teams. In the case of team building and development, it is essential to think of a personal question that relates to the personality characteristics of the members and the team leader, as well as the scope of the team and the competence of the leader. Before the team is set up, a team analysis must be performed

to determine the team-building parameter. Without analysis, we cannot identify the necessary control span and the synergistic effect of the team (Creasy, Carnes, 2017; Gelbarda, Carmeli, 2009).

1. LITERATURE REVIEW

The span of control expresses how many employees are directly subordinated to one supervisor (Urwick 1974; Ouchi and Dowling, 1974). The span of control can be different in the same enterprise at different hierarchical levels, but can also be different at the same level of control (McMullen and Nethersell, 2009). We distinguish *actual* span of control – which gives a realistic picture of how many subordinates correspond to one manager, from an *optimal* span of control, which presents the number of subordinates one manager can effectively manage in a given post. This means the maximum number of subordinates the team leader can effectively manage in terms of his/her limited physical and mental capacity.

Enterprises focusing on knowledge management and offering progressive training for talented employees can create more qualified teams. Teams with a higher span of control permit better selection of managers, higher likelihood of self-presentation, as well as faster results in the early stages of their career (Nikolowa, 2015). The performance of the teams and the overall effectivity of the organization can be estimated through the span of control. The maximum span of control is determined as the product of two independent variables – the individual index of company administration and how many managers manage one operation individually (Bagautdinova and Validova, 2014).

1.1 Span of control – determinants and span size

Till now implemented research studies have demonstrated that determining a specific span influences a variety of organizational parameters, with the most commonly used analytical approach. The analytical approach to the determination of the optimal span of control is represented by Graicunas' theory, based on the assumption that the head employee must manage the relationships that arise between him/her and his/her subordinates but also between his/her subordinates themselves (Urwick, 1974; Hopej and Martan, 2006). Graicunas concludes that if we arithmetically increase the number of subordinates, the relationships that the manager has to manage increase in geometric order, accelerating when they cross the border of 5-6 subordinates (Bedeian, 2017). Therefore it is insisted that the number of subordinates should not exceed the limit of 6 people. Many American companies today consider the number of 5-7 subordinates to be optimal.

V. A. Graicunas recommended a span of control of 5 employees, but of course depending on the level of management (it is different when 5 workers are subordinated to 1 supervisor or 5 divisions are subordinated directly to the general director), while the span must have its limitations (Urwick, 1974). H. Fayol argued that the number of subordinates at the lowest level of management should be 10 to 30, 15 on average, and 2 to 5 at the highest level of management.

However, there is no exact rule in determining the exact number of subordinates per one superior (Delbecq, 1968; Staats et al., 2012; Davison, 2003; House and Miner, 1969; Nasrallah, 2015; Pendharkar et al., 2009; Holm-Petersen et al., 2017; Wallin et al., 2014; Walter and Zimmermann, 2016) because the size of the span influences several determinants that deviate from industry, enterprise size, type of organizational structure, performance of the organization (Staats et al., 2012). Zagoršek (2014) is also dedicated to a team's performance in terms of individual performance. There are also the competence of the head employee, the personality of the subordinates and their experience, knowledge (Schyns et al., 2010), motivation and degree of engagement, innovation in the team (Peltokorpi and Merv, 2014).

Another factor is spatial organization. If the subordinates are concentrated in one place, it creates a lesser burden on the time and communication of the head employee. Conversely, if his/her subordinates are situated in different locations or even in different time zones, it places a heavy burden on the communication skills and time management of the head employee. As well as the quality of mutual relations in all directions (horizontal, vertical and diagonal) and the existence and efficiency of staff departments are important. The level of process organization and standardization– if the level of organization is optimal and the individual processes are standardized, appropriate conditions are created to increase the span of control (Udell, 1967).

2. METHODOLOGICAL APPROACH

Numerous research studies have so far well elaborated on factors influencing the span of control, such as the geographic interface, the competence of the team leader, as well as its individual members, the scope, similarity and volume of tasks in the team. The objective of our exploratory study is to identify the scope of influence of the individual parameters of the managerial work (size and composition of teams, functional area of activity, level of management) and the characteristics of the manager (age of the manager, owning the current managerial position) on the span of control within the organizational structure and the organization of team work. The statistical sample (N = 268 respondents) is comprised of managers operating in enterprises in the Slovak Republic in the management positions of operational, tactical and top management.

This category includes general directors, managing directors and business owners, directors and managers. The sample was created in PSPP by random selection. The aim of the study is to clarify the impact of these parameters at all levels of management in Slovak enterprises. The reason why we focused on this theme was that there are few scientific studies addressing the influence of selected elements of the organization and the characteristics of a manager and the nature of his/her work. The research was implemented using a questionnaire on the teamwork of managers, the scope of leadership and their position in the organizational structure. The data obtained through the questionnaire method present a nominal and ordinal variable

3. CONDUCTING RESEARCH AND RESULTS

3.1 Data analysis

The data obtained through the questionnaire method are of a nominal (level of management, functional area of control) and ordinal variable (the number of team members, the composition of the team members – men, women, both; age of the manager, owning the current management position - number of years). Thus the type of the variable also made the selection of statistical methods conditional. Two-dimensional inductive statistics methods were used to test the dependence of the nominal variables by a non-parametric test - The Chi-Square Test of Independence, and the coefficients for determining the dependence of the individual variables for the nominal data were Cramer's V, Lambda, and the Phi coefficient.

The Cohen scale was used to interpret the value of coefficients (Cohen, 1988). To determine the dependence of ordinal variables, the Kendall's tau-b, Goodman-Kruskal Gamma, Kendall's tau-c coefficients were used, and to determine the association in the dependent and independent variable, the Somer's d coefficient (Hanak, 2016) was used. The data were analysed in PSPP statistical software. Hypotheses were tested at a significance level of $p \leq 0.05$; while maintaining the primary rule of the Chi-Square Test of Independence, where the theoretical frequencies did not fall

below a value of 5 in 80%, and for other values X > 1 applied. Null and alternative hypotheses were tested, which we present in individual results.

The mapped development of organizational structures over the last 20 years has revealed two organizational trends. New managing directors begin their function with a wider span of control, trying to comprehensively understand the enterprise and all its activities. However, over time, once a steady state is reached, the span of control is gradually decreasing to a level consistent with the original enterprise norm (Neilson and Wulf, 2012). The second trend is that the new general director increasingly appears in the organizational structure without an official representative.

The positions of Chief Operating Officers (COO) gradually disappear in all sectors. The association between team size, the dominance of the general manager, and organization performance is significant in an environment that allows top managers broad discretion in strategic decisions, but is insignificant in environments with limited freedom (Haleblian and Finkelstein, 1993). The organizational structure (flat or high in relation to the span of control) can also affect the degree to which the manager is satisfied with his/her work in terms of how well he/she can achieve success with his/her team. In a flat organizational structure, managers perceive greater satisfaction than in a high organizational structure (Ghiselli and Johnson, 1970).

Of the N = 268 enterprises researched, up to 35% of them consists of teams of 6 to 12 members, 29.85% of enterprises consists of teams of up to 5 members, teams of more than 20 members are represented by 25% of enterprises, and the least used are teams of 13 to 20 people (10.07%). We present the summary results of the relationship of each variable in Table 1.

Table 1. Summary results table for association between variables

Variables/ association	1	2	3	4	5	6
1 No. of team members	-	V=.07 p = .843	V=.33 λ=.23 p =.02	G=.04 Tau b=.03		V=.28 λ=.18 p =.000
2 Management level		-				
3 Functional area of control			-			V=.16 p =.150
4 Age				-	G=.18 Tau b=.13 p = .012	
5 Owning position in years					-	
6 Gender						-

Source*: own compilation*

3.2. The team size that the manager leads and the level of management

The impact of the organizational structure on the span of control is evident, so we study the relationship between the management level, the functional areas of control and the size of the team. We assume that the largest teams are working at the lowest level of management, and vice versa, that top-level teams have the smallest span of control. We tested the following hypotheses:

H1: The size of the team that the manager leads directly depends on the level of management (operational, tactical, top management level)
H0: There is no statistically significant association between team size and management level

Table 2. Strength of Association for Management Level and Team Size

Category	Statistic	Value	Asymp. Std. Error	Approx. T	Approx. Sig.
Nominal by Nominal	Phi	.10			
	Cramer's V	.07			
N of Valid Cases		134			

Source: own processing with PSPP

We reject alternative hypothesis H1 at the significance level of p >.05, and accept null hypothesis H0. There is no statistically significant dependence between the researched variables (p = .843, ChiSQ =1.41, df = 4). Based on the results, we can state that different team sizes are active at all levels of management, and for a particular level of management, the team size is not specific. The result has refuted the assumption that the largest teams operate at the lowest level of management, and conversely, that top-level teams have the smallest number of members.

3.3 Team size and functional area of control

Based on the results of the research study on the impact of the functional area of control and the team size (Campion et al., 1993), the authors recommended that it is desirable to have 10 or less team members to ensure the effectiveness of a team. However, this recommendation is general and may not be applicable, for example, to producing conditions. A 12-member team is suitable for the functional area ,,producing" (Hirschfeld et al., 2006, Stewart, 2006). On a sample of Slovak companies, we observed the dependence of the functional area of control and the team size. We monitored if in functional areas such as producing, sales and logistics work significantly larger teams than in the functional areas of IT, marketing and PR, and human resources. We tested the following hypotheses:

H1: The size of the team that the manager leads depends directly on the functional area of control
H0: There is no significant dependence between team size and the functional area of control

Table 3. Strenght of Association for Functional area of control and No. of team members

Category	Statistic	Value	Asymp. Std. Error	Approx. T	Approx. Sig.
Nominal by Nominal	Phi	.47			
	Cramer's V	.33			
N of Valid Cases		144			

Table 4. Goodman – Kruskal's lambda

Category	Statistic	Type	Value	Asymp. Std. Error	Approx. T	Approx. Sig.
Nominal by Nominal	Lambda	Symmetric	.12	.06	2.09	.037
		Functional area of control Dependent	.02	.05	.45	.654
		NO. of members Dependent	.23	.09	2.35	.019
	Goodman and Kruskal tau	Functional area of control Dependent	.04			.
		NO. of members Dependent	.10			.

Source: own processing with PSPP

The H0 hypothesis is rejected at a significance level of p ≤ .05, and an alternative hypothesis H1 is accepted, because there is a strong evidence of association among the researched variables (p-value = .02, ChiSQ =31.36, df = 12). The dependence was confirmed by strength (V = .33) between the two variables, which is a moderate dependence. The Goodman-Kruskal's lambda coefficient was used to detect the error reduction for a dependent and independent variable. The dependence of the team's size on the functional area of control is λ= .23 (we reduced the error by 23% when predicting the dependent variable) and it is statistically significant because p = .019. There is a moderate dependence between the functional area of management and the size of the team that the manager leads, the size of the team depending on the functional area.

Teams consisting of 6 to 12 people (57% of enterprises) are typical for the IT area, with only 14% of the other sizes presented. For the area of finance there are teams consisting of up to 5 people (42% of enterprises) and 6 to 12 people in 38% of enterprises. Other sizes are reported by only 9% of enterprises on average. In manufacturing, up to 43% of enterprises declare teams consisting of over 20 people, from 6 to 12 people in 32% of enterprises.

In sales and logistics, there are teams of up to 5 people (50% of enterprises) and only 18% of enterprises have teams of more than 20 people. Based on the data analysis, we can evaluate the team size from 13 to 20 people as an atypical number, in only 10% of all enterprises. Most often enterprises consist of teams ranging from 6 to 12 people.

3.4 Team composition, functional area of control and team size

If the team size is characteristic for the functional area of control, is the composition of the team in terms of gender typical for it? We assume that the enterprise's organizational structure contains functional areas such as marketing and PR, human resources, where women predominate in the teams. Producing, IT, sales and logistics have many male and mixed teams. We tested the following hypotheses:

H1: There is a dependency between the functional area of control and the composition of the team (in terms of gender)
H0: The composition of the team is not typical (in terms of gender members) for any functional area of control

Table 5. Strength of Association for Functional area of control and Composition of the team

Category	Statistic	Value	Asymp. Std. Error	Approx. T	Approx. Sig.
Nominal by Nominal	Phi	.22			
	Cramer's V	.16			
N of Valid Cases		136			

Source: own processing with PSPP

We rejected alternative hypothesis H1 at the significance level of p >.05, and accept null hypothesis. There is no statistically significant dependence among the researched variables (p = .150, ChiSQ =6.75, df = 4). Based on the results, we can say that there are teams with different gender structure in all the functional areas of control. There are no purely female teams in *IT*, and in the functional areas of *sales and logistics*. Only 22% of managers stated that there is a purely female collective in the functional area of *finance* and 17% in *human resources*. No purely male teams are in *human resources*. The most frequent male collectives are presented by companies in *manufacturing* (34%).

We also monitored the dependence between *the size of the team and its composition (men, women, mixed)*.

We tested the following hypotheses:

H1 = The number of team members directly depends on the composition of the team (in terms of gender members)
H0 = There is no dependence between the number of members of the team and the composition of the team (in terms of gender).

Table 6. Strength of Association for No. of team members and Composition of the team

Category	Statistic	Value	Asymp. Std. Error	Approx. T	Approx. Sig.
Nominal by Nominal	Phi	.40			
	Cramer's V	.28			
N of Valid Cases		151			

Table 7. Goodman – Kruskal's lambda

Category	Statistic	Type	Value	Asymp. Std. Error	Approx. T	Approx. Sig.
Nominal by Nominal	Lambda	Symmetric	.13	.04	3.27	.001
		NO. of members Dependent	.18	.05	3.27	.001
		Gender in team Dependent	.00	.00	NaN	NaN
	Goodman and Kruskal tau	NO. of members Dependent	.08			.
		Gender in team Dependent	.10			.

Source: own processing with PSPP

The H0 hypothesis is refuted at a significance level of p ≤ .05, and an alternative H1 hypothesis is accepted, because there is a strong evidence of dependence (p-value = 0.00, ChiSQ = 24.30, df = 4), but this dependence is weak (V = .28). Goodman-Kruskal's lambda coefficient was used to determine the strength of dependence of the dependent variable of the team's size and the independent variable composition of the team. The dependence of the team size on its composition (only men, only women, mixed team) is λ= 18 (we reduced the error by 18% when predicting the dependent variable) and is statistically significant because p = .001. However, the strength of the dependence is weak. Only 27% of enterprises reports the team of 5 members consisting only of men. The least purely male teams are in a size of 6 to 12 people (10.41%). Most women's teams consist of up to 5 people (20.8%), and the least over 20 people (1.82%). The densest representation was mixed teams with a size of 6 to 12 people. Enterprises presented the smallest mixed teams at a size of up to 5 people (16.5%).

3.5 Team size, manager age and the number of years in the current position

The assumption for success in leadership positions is competence and experience, which increase with age. The question is whether the age of the manager is an indicator of the owning lead-

ing position. We monitored the current position, but we did not monitor the time span between recruitment and accepting a leading position, or leadership even after changing the employer, or other department. We tested the following hypotheses:

H1: The number of years in the current management position depends on the manager's age.
H0: There is no dependence between the manager's age and the number of years in the current managerial position.

Table 8. Strength of Association for Manager's age and Number of years in the current managerial position

Category	Statistic	Value	Asymp. Std. Error	Approx. T	Approx. Sig.
Ordinal by Ordinal	Kendall's tau-b	.16	.07	2.29	
	Kendall's tau-c	.16	.07	2.29	
	Gamma	.20	.09	2.29	
N of Valid Cases		143			

Table 9. Somer's d for Manager's age and Number of years in the current managerial position

Category	Statistic	type	value	asymp. std. error	approx. t	approx. sig.
Ordinal by Ordinal	Somers' d	symmetric	.16		2.29	.022
		age_interval de-pendent	.16	.07	2.29	.022
		owning of current position dependent	.17	.07	2.29	.022

Source: *own processing with PSPP*

We rejected null hypothesis H0 at the significance level of p <.05, and accept alternative hypothesis H1. There is a statistically significant dependence between the research variables (p = .012), but its intensity is very weak. There is a weak dependence (tau – b = .16) between the manager's age and the number of years in the current management position, although the duration of acting in the current position presents a dependent variable (d = .16). The assumption of increasing age, and thus of increasing experience (independent variable), also increases the duration of owning the leading position (dependent variable). Somer's d = .17 confirmed a weak dependence, which is statistically significant at p = .022.

We assume that with the manager's increasing age, the experience he/she uses to manage the team will also grow. The question remains whether there is a dependency between the growing number of team members and the age of the manager. We tested the following hypotheses:

H1 = There is a dependence between the team size and the age of the manager.
H0 = There is no dependency between the team size and manager's age.

Table 10. Strength of Association for Team size and Manager's age

Category	Statistic	Value	Asymp. Std. Error	Approx. T	Approx. Sig.
Ordinal by Ordinal	Kendall's tau-b	.03	.08	.32	
	Kendall's tau-c	.03	.09	.32	
	Gamma	.04	.12	.32	
N of Valid Cases		128			

Source: *own processing with PSPP*

We dismissed alternative hypothesis H1 at the significance level of p >.05, and accept hypothesis H0. There is no statistically significant association among the researched variables (p = .107, tau – b = .03, G = .04). There is no interdependence between the size of the team and the age of the manager.

We assumed that with the increasing age, and thus with increasing experience (independent variable), the team size (dependent variable) the manager can manage with increasing experience also grows. However, Somer's d = .03 and p = .752 confirmed the non-existence of a relationship as well as association of dependent and independent variables (p = .107, tau – b = .03, G = .04).

CONCLUSION

The span of control can be different in the same enterprise at different hierarchical levels and may be determined by a number of factors verified by several research studies. The article is focused on little-known determinants of the span, such as the age of the manager, the level of management, the functional area of management, and the gender of the members and their representation on a team.

Based on the results, we can state that different team sizes are active at all levels of management, and there is no characteristic team size for a particular level of management. The result has refuted the assumption that the largest teams operate at the lowest level of management, and conversely, that top-level teams have the smallest number of members.

The Goodman-Kruskal's lambda coefficient was used to detect the error reduction for a dependent and independent variable. The dependence of the team's size on the functional area of management is λ = .23 (we reduced the error by 23% when predicting the dependent variable) and it is statistically significant because p = .019. There is a low dependence between the functional area of management and the size of the team the manager manages, and the size of the team depends on the functional area. The same results were obtained by the authors of the span of control study in manufacturing functional areas (Campion et al., 1993), the result confirmed.

The composition of the teams in terms of the gender of the individual members determines the manner of their management. We monitored their composition according to functional areas of control. Teams with different gender structures are involved in all functional areas of control. There are no purely female teams in *IT*, and in the functional areas of *sales and logistics*. Only 22% of managers stated that there is a purely female collective in the functional area of *finance* and 17% in *human resources*. No purely male teams are in *human resources*. The most frequent male collectives are presented by companies in *manufacturing* (34%).

The Goodman-Kruskal's lambda coefficient was used to detect the error reduction for a dependent and independent variable. The dependence of the team size on the functional area of control is statistically significant, because p = .001, but with a low dependence of λ= .18.

Only 27% of enterprises reports the team of 5 members consisting only of men. The least purely male teams are in a size of 6 to 12 people (10.41%). Most women's teams consist of up to 5 people (20.8%), and the least of over 20 people (1.82%). The densest representation was mixed teams with a size of 6 to 12 people. Enterprises presented the smallest mixed teams at a size of up to 5 people (16.5%).

In relation to the age of the manager and his/her leading position we confirmed the assumption that with increasing age, and thus with increasing experience (independent variable), the duration of acting in a leading position (dependent variable) is also increasing. Somer's d = .17 confirmed a weak dependence, which is statistically significant at p = .022. With the current manner of managing an organization, the age of the manager is the weak indicator of the duration of the managerial position. We also monitored the relationship between the manager's age and size of

the team. We expected that also the size of the team (independent variable) grows with increasing age and with increasing experience (dependent variable). However, Somer's d = .03 and p = .752 confirmed the non-existence of a relationship as well as association of dependent and independent variables (p = .107, tau – b = .03, G = .04).

ACKNOWLEDGEMENT

REFERENCES

Bagautdinova, N., Validova, A. (2014), "Defining Optimal Span of Control for an Enterprise", *Procedia Economics and Finance*, Vol. 14, pp. 30-34.

Bedeian, A. G. (1974), "Vytautus Andrius Graicunas: A biographical note", *Academy of Management Journal*, Vol. 17, Issue 2, pp. 347-348.

Campion, M. A., Papper, E. M., Medsker, G. J. (1996), "Relations between work team characteristics and effectiveness: a replication and extension", *Personnel Psychology*, Vol. 49, pp. 429-452.

Cohen, J. (1988) *Statistical power and analysis for the behavioral sciences* (2nd ed.), N. J., Lawrence Erlbaum Associates, Hillsdale.

Creasy, T., Carnes, A. (2017), "The effects of workplace bullying on team learning, innovation and project success as mediated through virtual and traditional team dynamics", *International Journal of Project Management*, Vol. 35, Issue 6, pp. 964-977.

Davison, B. (2003), "Management span of control: how wide is too wide?", *Journal of Business Strategy*, Vol. 24, Issue 4, pp. 22-29.

Delbecq, A. L. (1968), "The world within the "span of control", *Business Horizons*, Vol. 11, Issue 4, pp. 47-56.

Eubanks, D. L., Palanski, M., Olabisi, J., Joinson, A., Dove, J. (2016), "Euba", *Computers in Human Behavior*, Vol. 61, pp. 556-568.

Gelbarda, R., Carmeli, A. (2009), "The interactive effect of team dynamics and organizational support on ICT project success", *International Journal of Project Management*, Vol. 27, Issue 5, pp. 464-470.

Ghiselli, E. E., Johnson, D. A. (1970), "Need satisfaction, managerial success, and organizational structure", *Personnel psychology*. Vol. 23, Issue 4, pp. 569-576.

Haleblian, J., Finkelstein, S. (1993), "TOP management team size, CEO dominance, and firm performance: the moderating roles of environmental turbulence and discretion", *Academy of Management Journal*. Vol. 36, Issue 4, pp. 844-863.

Hanak, R. (2016), *Data analysis for social sciences*, Econom, Bratislava (in Slovakian).

Holm-Petersen, CH., Østergaard, S., Andersen, P. B. N. (2017), "Size does matter – span of control in hospitals", *Journal of Health, Organisation and Management*, Vol. 31, Issue 2, pp. 192-206.

Hopej, M., Martan, J. (2006), "The determination of span of control", *Operations Research & Decisions*, Issue 2, pp. 55-62.

House, R. J., Miner, J. B.(1969), "Merging Management and Behavioral Theory: The Interaction Between Span of Control and Group Size", *Administrative Science Quarterly*. Vol. 14, Issue 3, pp. 451- 464.

Klug, M., Bagrow, J. P. (2016), "Understanding the group dynamics and success of teams", *Royal Society Open Science*. Vol. 3, Issue 4.

McMullen, T., Nethersell, G. (2009), "Do you have a plan for spans? New research on executive span of control", *Journal of Compensation and Benefits*, Vol. 25 Issue 1, available at: http://eds.a.ebscohost.com/eds/detail/detail?vid=3&sid=f68c937b-6a5c-42c4-8513-b953ec

55402a%40sessionmgr4008&bdata=JkF1dGhUeXBlPWNvb2tpZSxpcCx1cmwsY3BpZCZjdXN0aWQ9c2tsaWsJmxhbmc9c2smc2l0ZT1lZHMtbGl2ZQ%3d%3d#AN=edsbig.A193809086&db=edsbig (accessed on 27 January 2017)

Nasrallah, W. F., Ouba, C. J., Yassine, A. A., Srour, I. M. (2015), "Modeling the span of control of leaders with different skill sets", *Computational & Mathematical Organization Theory*, Vol. 21, Issue 3, pp. 296-317.

Neilson, G. L., Wulf, J.(2012), "How Many Direct Reports?", *Harvard Business Review*, Vol. 90, No. 4, pp. 112-119.

Nikolowa, R. (2015), "Career dynamics and span of control", *Economics Letters*, Vol. 128, Issue C, pp. 6-8.

Ouchi, W. G., Dowling, J. B. (1974), "Defining the span of control", *Administrative Science Quarterly,* Vol. 19, Issue 3, pp. 357-365.

Peltokorpi, V., Merv, H. (2014), "How Participative Safety Matters More in Team Innovation as Team Size Increases", *Journal of Business & Psychology*. Vol. 29, Issue 1, pp. 37-45.

Pendharkar, P. C., Rodger, J. A. (2009), "The Relationship between Software Development Team Size and Software Development Cost", *Communications of the ACM*, Vol. 52, Issue 1, pp. 141-144.

Schyns, B., Maslyn, J. M, Weibler, J. (2010), "Understanding the relationship between span of control and subordinate consensus in leader-member exchange", *European journal of work and organizational psychology*. Vol. 19, Issue 3, pp. 388-406.

Staats, B. R., Milkman, K. L., Fox, C. R. (2012), "The team scaling fallacy: Underestimating the declining efficiency of larger teams", *Organizational Behavior and Human Decision Processes*, Vol. 118, Issue 2, pp. 132-142.

Udell, J. G. (1967), "An Empirical Test of Hypotheses Relating to Span of Control", *Administrative Science Quarterly*. Vol. 12, Issue 3, pp. 420-439.

Urwick, L. F. (1974), "Graicunas and the span of control", *Academy of Management Journal*, Vol. 17, Issue 2, pp. 349-354.

Wallin, L., Pousette, A., Dellve, L. (2014), "Span of control and the significance for public sector managers' job demands: A multilevel study", *Economic and Industrial Democracy,* Vol. 35, Issue 3, pp. 455-481.

Walter, M., Zimmermann, J. (2016), "Minimizing average project team size given multi-skilled workers with heterogeneous skill levels", *Computers and Operations Research*, Vol. 70, pp. 163-179.

Zagorsek, B. (2014), "Working Hours and Its Impact on Quality of Sleep and Motivation" *Societas et iurisprudentia,* Vol. 2, Issue 4, pp. 98-110.