Abstract

Despite its importance, for micro, small, and, medium-sized enterprises (MSMEs), the impact of new service development performance (NSDP) on organizational performance (OP) and the significance of formal or standardized service development processes (SSDPs) remains unknown. This study proposes that NSDP is positively associated with OP and that SSDPs positively moderate this direct effect. These and other hypotheses are tested with data collected from 801 Irish service MSMEs using Partial Least Squares Structural Equation Modelling (PLS-SEM) and multigroup analysis. Our results reveal that a positive relationship exists between NSDP and OP and we report the magnitude of this relationship for micro, small, medium-sized organizations; while the moderating effect of SSDPs was not supported for each of these groups. We thus provide novel empirical insights into service development for MSMEs, where our findings suggest that SSDPs are of particular importance for small organizations.

Keywords: NSD Performance, NSD Processes, Organizational Performance, MSMEs, MICOM

The Roles of NSD Performance and Standardized Service Development Processes in the Performance of Micro, Small, and Medium-Sized Enterprises

1. Introduction

As the service sector accounts for the majority of economic activity in industrialized economies (OECD, 2005), the development of new services is a central concern for many businesses (Kitsios and Kamariotou, 2020). Principal among these are micro, small, and medium-sized enterprises (MSMEs), organizations with fewer than 250 employees (European Commission, 2005), which are under continuous pressure to adapt to changes in customer demands through the introduction new services (McDermott and Prajogo, 2012). Indeed, new services are fundamental to their ability to achieve growth, sustain profitability, and ensure ongoing competitiveness (Yang, 2007) and without them the survival of these organizations would be in jeopardy (Casidy et al., 2020). It is for this reason, new service development (NSD) has been described as a "mandatory management task" for smaller businesses (Ottenbacher et al., 2006: 77).

While it is unsurprising, then, that NSD is recognized by practitioners and scholars as an important topic that is deserving of attention (Tajeddini, 2011), NSD, particularly in the context of MSMEs, is an area that remains relatively unexplored (Oke et al., 2007). This deficiency is brought into particularly sharp relief when compared with the extensive body of empirical research that examines new product development (NPD) in the manufacturing sector (Page and Schirr, 2008) or the service development activities of large organizations (Witell et al., 2017; Jaakkola and Hallin, 2018). The result of this imbalance in the literature is confusion about whether our understanding of NSD applies to MSMEs (McDermott and Prajogo, 2012) and whether there are any differences between smaller enterprises in their service development activities (Prajogo et al., 2013). This has meant that the impact of new service development performance (NSDP) on the overall performance of MSMEs, or the importance of formal or

standardized service development processes (SSDPs), is unknown (Ottenbacher, Shaw and Ermen, 2006; Khan et al., 2011).

Therefore, while it is implied by existing literature that NSD performance has a positive impact on organizational performance (OP) (Tajeddini, 2011; Kitsios and Kamariotou, 2020) and that SSDPs play an important role, these conjectures have not been substantiated in the context of MSMEs. Neither the magnitude of the relationship between NSDP and OP has been established for micro, small, or medium-sized enterprises, or the extent to which it is moderated by standardized service development processes. In fact, the importance of SSDPs to MSMEs has been almost entirely neglected, as have explorations of differences in the relationships between these variables among micro, small, and medium-sized organizations (Cagliano et al., 2001; McAdam et al., 2004; Prajogo, McDermott and McDermott, 2013).

In this study, we respond to this shortcoming and provide empirical insights into the relationship between NSDP and OP for MSMEs and the moderating role of SSDPs. Notably, the research provides greater detail into the differences in these relationships than any study has done to date, discriminating between micro, small, and medium-sized organizations and performing multigroup analysis to compare and contrast empirical results.

To test our hypotheses, we conducted research in the Republic of Ireland, obtaining responses from 801 service MSMEs (491 micro, 233 small, and 77 medium). Micro organizations have 1-9 employees, small have 10-49, and those that are medium-sized have between 50-249 (European Commission, 2005). Each of these size groupings are expected to have somewhat different characteristics and approaches to the development of new services (Schilling and Werr, 2009; Khan, Lieb and Meiren, 2011; Prajogo, McDermott and McDermott, 2013). Partial Least Squares structural equation modeling (PLS-SEM) was used to analyze data and test hypotheses. In addition to testing hypotheses regarding the relationships between key variables and the moderating effect of standardized service development processes, we applied MICOM

(Measurement Invariance of Composite Models) and multigroup analysis to examine whether there were differences in hypothesized relationships between the size groupings.

The results of this study offer managerial insights, highlighting the importance of SSDPs to small organizations, and make several meaningful contributions to NSD research. First, we provide convincing empirical support for the relationship between NSDP and OP and quantify its magnitude for micro, small, and medium-sized organizations. As expected, this relationship is strong and significant for all examined size groups and strongest for the medium-sized category. Second, our findings imply that standardized service development processes are of importance to enhancing the new service development performance of each of the size groupings, but only contribute to the overall performance of small organizations; and we illustrate that only in the context of small organizations are the effects of NSDP on OP contingent on standardized service development processes, where organizations that utilize SSDPs strengthen the relationship between NSDP and OP.

This paper has the following structure: In the next section, we overview literature on the relationships and interaction of new service development performance, organizational performance, and standardized service development processes, presenting the research hypotheses. Section 3 introduces the research methodology, prior to the testing of hypotheses and the reporting of results in Section 4. The final section discusses the results and various implications and limitations of the study are suggested before potential research directions are proposed and the article concludes.

2. Theoretical Background and Hypotheses

Our study builds upon a limited body of empirical research that explores the relationship between new service development performance and organizational performance. This relationship has formerly been examined in the context of financial services (Menor and Roth, 2008), hospitality (Tajeddini, 2011), and large organizations (Storey and Kahn, 2010) and,

while the consensus view seems to be that a positive association exists between these variables (Kitsios and Kamariotou, 2020), this has not yet been established for micro, small, and medium-sized organizations generally.

NSDP is regarded as a "competitive driver" (Yang et al., 2016: 275) and is associated with the exploitation of market opportunities, attracting new customers, increased profitability, and sustained competitiveness (Storey and Easingwood, 1999; Menor et al., 2002; Jin, 2012). Service development literature highlights its essential role in responding to environmental changes and market turbulence (Storey and Perks, 2015), meaning it is an important consideration for the management of service organizations which often must develop new services quickly and effectively in response to the actions of their competitors (Storey and Kahn, 2010).

New service development performance is typically regarded as a multidimensional phenomenon (Menor, Tatikonda and Sampson, 2002) that represents "innovations in new services or service procedures that achieve efficient operations and superior performance" (Yang, Lee and Cheng, 2016: 275). Its dimensions capture the speed and success with which an organization introduce new services and their subsequent market performance (Menor and Roth, 2007). Though similar to a related term, service innovation performance, it is distinct from it by encompassing the architectural elements through which new services are delivered (Storey and Kelly, 2001) and it is often measured with metrics comparable to those for NPD (Menor, Tatikonda and Sampson, 2002). Organizational performance is ordinarily captured using perceptual or objective financial measures, non-financial performance measures, or a blend of both (Feng et al., 2020). While the multi-dimensional nature of organizational performance means that it is complex to measure (Venkatraman and Ramanujam, 1987), several authors suggest that a close association exists between objective and perceptual measures (Dess and Robinson Jr, 1984; Pearce et al., 1987). In order to obtain a broad

understanding of the performance of organizations, measures that include both financial and market performance measures are recommended (Li and Atuahene-Gima, 2001; Hooley et al., 2005).

Several studies suggest that NSDP directly influences OP, but Menor and Roth (2008) were among the first to empirically investigate this relationship. They observed that, though the relationship between NPD performance and the performance of manufacturing organizations had been examined, no similar studies existed which explored its equivalent relationship in the context of services (Menor and Roth, 2008). Using a sample of financial services organizations, their research suggests a statistically significant relationship between new service development competence and a measure of performance, return on assets (Menor and Roth, 2008). Similarly, Storey and Kahn (2010) demonstrate that a significant positive relationship exists between NSD proficiency and sustainable competitive advantage in large service organizations, and Tajeddini (2011) reveals, in the context of the hospitality sector, that NSDP is a determinant of performance. This is because organizations with greater NSDP are able to make decisions that allow them to quickly respond to their environment and optimize their resources to create high quality new services that enhance their profitability and performance (Storey and Kahn, 2010; Tajeddini, 2011). As it is suggested that NSDP has a positive influence on OP from both a theoretical and empirical point of view, our first hypothesis is that:

Hypothesis 1. New service development performance positively affects the performance of MSMEs.

Various views regarding formal or standardized service development processes and their importance to organizations of different sizes have been advanced in the literature. Zomerdijk and Voss (2011: 65) define them as “the set of activities, actions, tasks, and evaluations that move a project from the idea stage through to launch” and, though the authors list what they believe are the typical stages in the service development process, this is a topic that is

contentiously debated in the literature. Indeed, divergent views have been proposed that differ in the number and purpose of steps that are supposedly used to systematically develop new services (Edvardsson et al., 2013). Many of these are derived from the stage-gate models used by manufacturers (Witell et al., 2017) or are variations of a notable six stage NPD process model, created by Booz et al. (1982), which consists of the following steps: NPD strategy, idea generation, screening and evaluation, business analysis, development, testing, and commercialization. Though often based on this model, representations of the number of steps in new service development range from four (Johnson et al., 2000) to 15 (Scheuing and Johnson, 1989).

To date, no consensus has emerged around the NSD process (Tajeddini, 2011). Jin et al. (2014) believe that existing process models are merely guides for service firms, while Dolfsma (2004) argues that the division of this process into separate phases is arbitrary and only has the purpose of making key decisions appear more rational. Because, in reality, there may be no single best way to organize service development that applies to all organizations (Zomerdijk and Voss, 2011) and, in order to avoid the association that the term *formal service development processes* has with established, inflexible bureaucratic procedures that follow a defined sequence of steps (Johne and Storey, 1998), we choose to use the term *standardized service development processes*. This more comprehensive term describes a codified and repeatable service development method (Sjödin et al., 2016), but neither specifies the activities involved nor their order to better accommodate the heterogeneity and distinctiveness of NSD in individual organizations.

However, there is some debate about whether service organizations use NSD processes at all, with some researchers suggesting that they do not (Scheuing and Johnson, 1989; Martin Jr and Horne, 1993) and that new services are developed in non-linear ways (de Jong and Vermeulen, 2003). Some of this cohort contend that new services are the result of "intuition, flair, and luck"

(Menor, Tatikonda and Sampson, 2002: 135); that NSD is unsophisticated, haphazard, ad hoc, and based on trial and error (Zomerdijk and Voss, 2011); or that the development of new services is something that happens informally and "'new' services tend to evolve over time in response to changes in client needs or competitive offerings" (de Brentani, 1991: 36).

Though it is argued that NSD processes add rigidity and bureaucracy (Zomerdijk and Voss, 2011), hampering service development initiatives and negatively influencing NSDP (Witell et al., 2014), Menor and Roth (2008) disagree to an extent, arguing that some process structure is necessary to NSDP. Similarly, Warren and Davies (2016) and others (de Brentani, 1991; Voss, 1992; Martin Jr and Horne, 1995; Dolfsma, 2004; Storey and Hull, 2010; Warren and Davies, 2016) maintain that structured service development processes are necessary for organizations to effectively develop new services. This is because NSD processes provide rules that guide service development initiatives (de Jong and Vermeulen, 2003), can enhance communication, improve project flow, and reduce activities that do not add value, increasing the speed and efficacy of service development (Khan, Lieb and Meiren, 2011; Melton and Hartline, 2015).

Several empirical studies suggest that the standardization or formalization of service development activities increases NSDP. For instance, Froehle et al. (2000) demonstrate that NSD processes directly contribute to the speed of service development, while Edvardsson et al. (2013) and Storey and Perks (2015) show that there is a positive and significant relationship between processes of this type and NSDP. Though empirical tests of the relationship between NSD processes and development performance are more prevalent in the NPD literature than in services literature (Froehle et al., 2000) and this relationship has not been tested for MSMEs, on the basis of the strong evidence provided by existing empirical studies, we advance the view that greater standardization of NSD processes should lead to improved NSDP and hypothesize that:

Hypothesis 2. Standardized service development processes positively affect the new service development performance of MSMEs.

Despite only limited research regarding how SSDPs affect organizational performance, Storey et al. (2016), in a meta-analysis, classify 'formal/structured service development processes' as an antecedent to strategic competitive advantage. Similarly, Jin, Chai and Tan (2014) are of the view that firms which execute their NSD processes in a standardized way, experience greater success than those who do not. This may be because standardized processes help organizations to focus their service development efforts on addressing market requirements (Dolfsma, 2004) and increase the number and speed of new services they are able to introduce, resulting in increased sales (Melton and Hartline, 2015).

Khan, Lieb and Meiren (2011) test these theoretical contributions, showing that significant relationships exist between NSD processes and various key indicators of performance; sales, profitability, market share, and innovation; in German and Swiss service organizations. Likewise, de Brentani (1989) shows that SSDPs are linked with both 'sales and market share performance' and 'competitive performance'. In this light, our third hypothesis is:

Hypothesis 3. Standardized service development processes positively affect the performance of MSMEs.

As the literature suggests that organizations which develop services using systematic or methodical processes enjoy greater success than those which do not (Jin, Chai and Tan, 2014), it can be reasoned that the effect of NSDP on OP may be contingent upon the degree of standardization with which new services are developed. This is because the use of SSDPs increases the effectiveness, efficiency, and predictability (Jin, 2012) with which organizations are able to introduce new services (Witell et al., 2017), allowing them outperform competitors by seizing 'first mover' advantages (Froehle et al., 2000), ensure a satisfactory fit for clients

(de Brentani, 2001), and, as a result, achieve higher sales (Melton and Hartline, 2015) and greater market success (Zomerdijk and Voss, 2011).

Therefore, we argue that SSDPs moderate the influence of NSDP on OP for MSMEs by increasing the formality and effectiveness of NSD activities. That is, that NSDP has a direct effect on OP, but its strength is dependent on whether an organization utilizes standard NSD processes during the development of new services. We hypothesize that:

Hypothesis 4. Standardized service development processes strengthen the positive effect of new service development performance on MSME performance.

The question of whether the size of an organization effects their innovation performance is a controversial topic and studies that relate the size of organizations to innovative outputs have been mixed (Stock et al., 2002). On one side of this debate is the view that the innovative performance of smaller organizations is better or more intensive than their larger rivals (Bommer and Jalajas, 2002; Mohnen and Röller, 2005). This is attributed to the flexibility and responsiveness of these organizations, which allows them rapidly adapt and launch more radical innovations, while larger organizations are characterized as being more formal, less open to risk, inflexible, and slow to react (Chandy and Tellis, 2000). Opponents of this perspective equate larger organizations with better and more abundant resources (Lin et al., 2007; Abreu et al., 2010); including financial slack, marketing and managerial skills, and research and development capabilities and experience (Damanpour, 1992; Çakar and Ertürk, 2010); that allow them to develop and commercialize new products and services. This allows them to launch more (Storey and Hughes, 2013) and better performing market offerings (Ettlie and Rubenstein, 1987). As it appears from the literature that firm size has a positive impact on the market performance of a new service (Smith-Eckhardt, 2015), we argue that the relationship between NSDP and OP will be stronger for larger organizations and hypothesize that:

Hypothesis 5. There is a stronger positive relationship between new service development performance and organizational performance for medium-sized organizations than there is for those that are micro or small.

Figure 1 presents a structure of the research model and outlines the examined relationships.

[Insert Figure 1 About Here]

3. Methodology

3.1 Data Collection and Sample

In order to test the hypotheses, survey data were collected from for-profit micro, small, and medium-sized Irish service organizations. The classification of these organizations is consistent with current European Union guidelines (European Commission, 2005) where: micro-enterprises employ fewer than 10 persons; small enterprises employ 11-49 persons; and medium-sized enterprises employ 50-249 and have an annual turnover that is below €50 million. Therefore, the criteria for organizations to participate in this study included the following: (i) the organization is a service business and (ii) has between 1-249 employees and an annual turnover that does not exceed €50 million. Target informants were anybody in the business with knowledge of that organization's service development activities and performance.

Prior to large-scale data collection, the questionnaire was pretested to check the clarity and comprehensibility of all questions and instructions. First, 11 academic researchers, knowledgeable in both services and survey design, served as expert judges, assessing the content and appropriateness of the questionnaire. Next, we conducted a field-based pretest, where feedback was sought from a convenience sample of 11 practitioners who were similar to intended respondents. As a result, modifications and refinements were made to the wording of some instructions based on the comments and suggestions received.

As there was no sampling frame, or a complete list of Irish service MSMEs and their contact information, to collect data, the email addresses of 19,892 organizations were drawn from the databases of a research group located at Waterford Institute of Technology, Ireland. This database was simply a record of Irish organizations and did not contain information about their principal activities, size, or whether they were in business at the time of the study. SurveyMonkey was used to collect all data. This is an online application for survey development and administration which allows personalized email messages to be sent, containing a unique, single-use link to a survey questionnaire. All data were collected over a 24-day period, during which time, five waves of emails were sent, each containing a link that permitted a single response from the recipient of that invitation. Initially, 19,892 unique invitation emails were sent which assured recipients of the anonymity and confidentiality of their responses. They also informed recipients that a range of answers were possible and that none were correct or incorrect for the purpose of attenuating social desirability. Of these messages, 2,143 could not be delivered due to the destination address being outdated or that emails from SurveyMonkey were blocked. Following this, four reminders were sent to the remaining 17,749 contacts. Overall, we received 1,962 responses, achieving an acceptable response rate of 9.86%, similar to other service industry research (Aspara and Tikkanen, 2013; Alexiev et al., 2016)

Next, we needed to exclude responses. First, 767 participants failed to fully complete and submit the questionnaire, rendering their data unusable. Second, we excluded all responses from informants that indicated that their business was not a service organization. Finally, any responses by organizations with more than 249 employees or an annual turnover in excess of €50m were removed. This procedure limited the final sample to 801 firms, for an actual response rate of 4.03%.

Missing data were not an issue as SurveyMonkey was configured not to allow any questionnaires with unanswered questions to be submitted. In adherence with guidance from Hair et al. (2016), data were then examined for suspicious response patterns and outliers. No evidence could be found of 'straight lining' by respondents and none of the submitted questionnaires were completed at an implausible speed (Vandenplas et al., 2018). 61.3% of responses were from micro organizations, 29.1% from small organizations, and 9.6% from those that were medium-sized. Further details of the sample's characteristics are reported in Table 1.

[Insert Table 1 About Here]

To confirm that the sample sizes were sufficiently large for the micro, small, medium groups, the inverse square root and gamma-exponential methods were utilized. Kock and Hadaya (2018) recommend these approaches for researchers using PLS-SEM as they regard the ten-times rule, which is typically used for evaluating the adequacy of sample size, as inappropriate with this class of structural equation modeling. Both tests were conducted using WarpPLS 7.0. The minimum absolute significant path coefficients were 0.350, 0.191, and 0.312 for the micro, small, and medium-sized groups, respectively. A significance level of 0.05 and an 80% power level was tested for each of the groups. The results of the sample size estimation were 51, 170, 64 for the inverse square root method and 37, 156, 50 for the gamma-exponential method for the micro, small, and medium groups, respectively. Hence, the actual size of the samples for each of the groups, 491, 233, and 77, could be deemed sufficient. In addition, post hoc power tests of the three samples were conducted using G*Power 3.1 software. The power index for the micro, small, and medium groups was 0.9999999, 0.9991594, and 0.8620804, respectively, exceeding the recommended threshold of .80 advanced by Cohen (1988; 1992).

When independent and dependent variables are measured using cross-sectional, single respondent data, researchers must be aware of the potential impact of common method bias

(CMB). This can occur where variables share systematic covariance that can bias the estimation of hypothesized relationships (Podsakoff et al., 2003). To control and minimize this potential issue, both *ex ante* and *ex post* control procedures were applied to account for the influence of CMB. *Ex ante*, all participants were assured of the anonymity and confidentiality of their responses and the questionnaire opened with the statement that there were no correct or incorrect answers, meaning that respondents should answer honestly (Podsakoff et al., 2003). *Ex post*, CMB was accounted for using Harman's one-factor or single-factor test (MacKenzie and Podsakoff, 2012). For this test, "all the variables of interest are entered into a factor analysis" and, if only a single factor emerges or one 'general' factor accounts for the majority of covariance in the variables, then common method bias is present (Podsakoff and Organ, 1986: 536). The results showed that the first factor in the unrotated solution accounted for 42.788% of the variance in the micro sample, 45.140% in the small sample, and 48.161% in the medium sample. Accordingly, as neither of the conditions advanced by Podsakoff and Organ (1986) were fulfilled, this supported the notion that common method bias did not represent a concern with these data and was not a threat to this study.

3.2 Measures

All latent variables, new service development performance and organizational performance, were established multi-item scales adopted from other studies (see Appendix Table A.1). For all scales, participants responded on a 5-point Likert scale with responses ranging from 1 (*strongly disagree*) to 5 (*strongly agree*) for NSD performance and 1 (*considerably worse*) to 5 (*considerably better*) for the organizational performance scale. These indicated their agreement with statements that reflected each of the latent variables. To measure NSD performance, we adopted a 5-item scale that was developed by Yang, Lee and Cheng (2016) and deemed reliable and valid. We measured organizational performance with an established

9-item scale from Li and Atuahene-Gima (2001) that had five financial and four market performance measures.

As there is disagreement about the number and purpose of steps in a formal or systematic service development process, a single-item measure was employed which simply asked whether the respondent's organization had standard processes in place for the development of new services. Feedback obtained during the pretest confirmed that this question could be understood and interpreted correctly by respondents. As the scope of this question is narrow, unambiguous, and unidimensional, this meant that the use of a single-item measure was appropriate (Bergkvist, 2015).

3.3 Data Analysis

PLS-SEM was used to analyze data and to test hypotheses. This is a variance-based structural equation modeling (SEM) method. All analyses were performed using SmartPLS version 3.3.2. (Ringle et al., 2021). This approach was chosen in favor of covariance-based SEM, as partial least squares (PLS) exhibits robustness when data are nonnormally distributed (Hair et al., 2016), is particularly suited to causal-predictive analyses (Evermann and Tate, 2016; Chin et al., 2020; Hair and Sarstedt, 2021), and has been widely applied in several recent services-related studies (Lee et al., 2021; Li et al., 2021; Santos-Vijande et al., 2021).

4. Results

A two-phase procedure was utilized to test the measurement and structural models for the micro, small, and medium groups prior to evaluating hypothesized relationships. This ensures the reliability and validity of measures prior to testing direct and moderating relationships.

4.1 Measurement Model

Adhering to recommendations advanced by Henseler et al. (2009) and Götz et al. (2010), the indicator loadings were first examined. These are shown in Table 2. Though indicator loadings of above 0.7 are desired at this stage, the loadings for NSDP1, OP5, and OP9 were marginally

below this level for the micro and small groups. However, Chin (1998: xiii) maintains that loadings of "at least 0.60" are acceptable while those of "0.70 or above" are ideal. When considered in combination with subsequent results, the reliability of these individual items could be considered adequate (Moores and Chang, 2006). Indeed, minimum composite reliability scores exceeded the recommended threshold (0.7) (Fornell and Larcker, 1981) for all groups as did those for Cronbach's α (0.7) (Cronbach and Meehl, 1955), Average Variance Extracted (AVE) (0.5) (Götz, Liehr-Gobbers and Krafft, 2010), and Dijkstra-Henseler's rho (ρA) (0.7) (Dijkstra and Henseler, 2015) (see Table 2). Together these analyses provide evidence for all groups of satisfactory reliability and convergent validity at the construct level.

[Insert Table 2 About Here]

The discriminant validity of latent variables was then tested using the heterotrait-monotrait (HTMT) approach. Results from the HTMT approach indicated that all construct correlations for each of the groups yielded values that were below the conservative threshold of 0.85 (Henseler et al., 2015). Additionally, Henseler, Ringle and Sarstedt (2015) suggest that when HTMT confidence intervals do not contain 1, discriminant validity can also be established. This was tested using the bootstrapping procedure with 5,000 samples, where none of the HTMT confidence intervals for any of the groups contained a 1, providing confirmation of the discriminant validity of all latent variables.

4.2 Structural Model

Upon confirmation of the reliability and validity of construct measures, an evaluation of the structural model is required (Hair et al., 2019). This involved an assessment of the variance inflation factor (VIF), the R^2 of endogenous latent variables, PLSpredict Q^2 criterion, and the direction and significance of path coefficients (Götz, Liehr-Gobbers and Krafft, 2010). For each group, all VIF values were below 2, indicating that there are no collinearity issues among the predictor constructs in the model. The 5,000-resample PLS bootstrapping procedure was

used confirm that the R^2 results for each of the groups showed adequate predictive accuracy (Hair et al., 2016).

Further, the PLSpredict procedure with 10 folds and 10 repetitions was used to examine the model's out-of-sample predictive power. Shmueli et al. (2019) advise that when errors are distributed symmetrically, the predictive power assessment should be based on the root mean squared error (RMSE). As illustrated in Table 3, for the majority of indicators, the PLS-SEM analysis yielded lower or equal prediction errors in terms of RMSE compared to the linear model (LM) generated by the PLSpredict algorithm. This indicates that the model has medium predictive power (Hair et al., 2019).

[Insert Table 3 About Here]

Table 4 shows the results of model relationships, including standardized coefficients, effect sizes, standard deviation, t-values, and significance.

[Insert Table 4 About Here]

4.3 Hypothesis Tests

The bootstrapping results, presented in Table 4, show that NSDP has a positive effect on OP (Micro: $\beta = 0.501$, $p = 0.000$; Small: $\beta = 0.448$, $p = 0.000$; Medium: $\beta = 0.630$, $p = 0.000$) for each of the groups, supporting hypothesis H_1. Further, for all groups, SSDPs have a positive effect on NSDP (Micro: $\beta = 0.350$, $p = 0.000$; Small: $\beta = 0.300$, $p = 0.000$; Medium: $\beta = 0.312$, $p = 0.004$), supporting H_2, though they only have a significant effect on OP for small organizations ($\beta = 0.191$, $p = 0.001$), providing partial support for H_3. The effect sizes (f^2) of these hypotheses, reported in Table 4, represent the strength of the influence of predictor variables. Cohen (1988) designates f^2 effect sizes of 0.02, 0.15, or 0.35 as small, medium, and large, respectively. In addition to testing the foregoing hypothesized paths, the potential moderating effect of SSDPs on the relationship between NSD performance and organizational performance was also tested for each of the groups. This required an extension of the basic

structural model and an interaction term was generated for each group using the two-stage approach recommended by Becker et al. (2018). This approach is recognized as suitable for testing moderating effects in PLS models with reflective measures (Fassott et al., 2016). Results reveal that the interaction term is only significant for small organizations ($\beta = 0.148$, $p = 0.016$), thus providing partial support for H_4. The f^2 value for the relationship between the interaction term and OP is 0.028. As the average effect size in tests of moderation is 0.0009 (Aguinis et al., 2005), Kenny (2018) suggests that "a more realistic standard for effect sizes might be 0.005, 0.01, 0.025 for small, medium, and large, respectively." According to this classification, the interaction term has a large effect size (see Table 5). To illustrate this interaction effect, we followed an approach similar to Cohen *et al.*'s (2003) simple slopes analysis (see Figure 2). This illustrates that when small organizations utilize standard processes for the development of new services, the association between NSD performance and organizational performance is stronger than when standardized service development processes are not used.

[Insert Table 5 About Here]

[Insert Figure 2 About Here]

4.4 Multigroup Analysis

This study uses a permutation test for a multigroup analysis to detect the differences in the effect of NSDP on OP for micro, small, and medium-sized organizations. A two-category approach was applied which resulted in three comparisons: micro-small, micro-medium, and small-medium. However, prior to evaluating differences in the magnitude of this effect for the size groupings, confirmation of measurement invariance was necessary (Sarstedt et al., 2011b). For this, the three-stage MICOM procedure advanced by Henseler et al. (2016) was followed. Initially, this requires configural invariance to be established by confirming that identical indicators were used across groups and that data were treated and analyzed in the same way

across groups (Henseler, Ringle and Sarstedt, 2016). As the questionnaire was identical for all groups and data were both prepared and analyzed using uniform methods, configural invariance could be confirmed and allowed us to proceed to the next step. For this, compositional invariance was evaluated using the results of permutation analysis in SmartPLS with 5,000 permutations. Henseler, Ringle and Sarstedt (2016) assert that *c* values that are close to 1 provide evidence of compositional invariance between groups (see Table 6). Permutation test results confirmed that none of the *c* values were significantly different from 1, allowing us to conclude that there is compositional invariance for all measured constructs in our model. In the final step of testing for measurement invariance across groups, both the equality of mean values and variances across groups were examined using permutation analysis. See Table 6 for full MICOM results.

[Insert Table 6 About Here]

As configural invariance and compositional invariance were confirmed in steps 1 and 2, respectively, but step 3 showed that not all means and variances for measures were equal, only partial measurement invariance was established (Henseler, Ringle and Sarstedt, 2016). Nevertheless, this facilitates the comparison of standardized path coefficients across groups, using multigroup analysis, to examine differences in their magnitude or signs.

From Table 5, it can be seen that there is some contrast in the strength of corresponding path coefficients. Whether these differences between the groups are significant was calculated using SmartPLS Multi-Group Analysis (PLS-MGA), a non-parametric test that builds on bootstrapping results (Sarstedt et al., 2011a). These results are reported in Table 7.

[Insert Table 7 About Here]

While H_5 predicted that there would be a significant difference in the effect of NSDP on OP between the size groupings, where it would be stronger for medium-sized organizations than for those that are small or micro, this hypothesis was not supported. Indeed, the only modelled

path for which a statistically significant difference between groups was identified, was for that between SSDPs and OP and only when comparing micro and small businesses.

5. Discussion

5.1 Theoretical Contributions

This work makes several theoretical contributions to service development literature by examining the effect of standardized service development processes on new service development performance and the overall performance of micro, small, and medium-sized firms.

First, it shows that SSDPs affect the overall performance of only small organizations. This finding contrasts somewhat with research by Khan, Lieb and Meiren (2011) which reports significant relationships between NSD processes and key indicators of performance. Their research suggests that formalized NSD processes have a positive impact on sales and profitability in one country; and sales, profitability, market share, and innovativeness in another. The authors believe that many of their hypotheses were not confirmed due to the large number of smaller enterprises that participated in the research for whom NSD process formalization is very low. Our results extend this literature base by suggesting that small organizations that are close to customers and able to respond to their valuable feedback (Berthon et al., 2008), are best able focus their service development efforts to speedily address market requirements through customized services that increase their sales and overall performance (Dolfsma, 2004; Melton and Hartline, 2015).

The study also makes a novel exploration of the moderating effect of SSDPs on the relationship between NSDP and OP. To our best knowledge, an interaction of this type had not been explored in prior research. Our contribution suggests that the NSDP-OP relationship is stronger only for small organizations which use standardized NSD processes, indicating that they allow them to achieve greater performance benefits. Extant literature advances the view that SSDPs

can enhance the predictability (Dooley et al., 2001) or reduce the risk of service development initiatives (Jin, Chai and Tan, 2014), increasing their efficiency, effectiveness, and outcomes (Froehle et al., 2000; Storey et al., 2016), however, there is no clear view or definite empirical results on the moderating effect of SSDPs. Knowledge of the effect of SSDPs has predominantly come from studying large organizations with a stable resource base (Witell et al., 2017), meaning that this contribution is important as it provides a deeper understanding of service development activities in smaller and resource-constrained organizations.

One interesting and unexpected result was that there was no significant difference in the magnitude of the relationship between NSDP and OP for organizations of different sizes. While it might be expected that the strength of this effect would be larger for organizations that have a greater number of resources than their smaller rivals (Laforet, 2008), no significant differences between any of the groups were found. This finding is consistent with Menor and Roth (2008) and Tajeddini (2010) who control for firm size in their research and find that it has no significant effect on NSD. An explanation for this may be that the relationship between the size of organizations and innovative outcomes is only significant for manufacturing organizations or for those that are far greater in size than the medium-sized organizations investigated in this research (Damanpour, 1992).

A second unexpected result was that there are significant differences in the effect of SSDPs on OP between micro organizations and small organizations. This is interesting because, although micro organizations demonstrate the strongest relationship between SSDPs and NSDP, not only is the relationship between SSDPs and OP non-significant, it is negative, too (see Table 5). This may be because adhering to formal or bureaucratic service development processes takes time or attention away from other value creating areas of businesses (Witell et al., 2014) that, typically, have very limited resources.

Aspects of this research that examine the relationship between NSDP and OP, and that between SSDPs and NSDP, are consistent with existing studies (Menor and Roth, 2008; Warren and Davies, 2016). Accordingly, they suggest that NSDP positively influences OP and that SSDPs are a reliable predictor of NSDP. However, we extend the literature base by examining the above links in the context of MSMEs, advancing understanding in this context by discriminating between micro, small, and medium-sized enterprises. Thus, we believe that this study addresses calls for service development research that focuses specifically on MSMEs and explores the relative importance of relationships between key variables for MSMEs of different sizes (McAdam, Reid and Gibson, 2004; Schilling and Werr, 2009; McDermott and Prajogo, 2012). Our findings illustrate that MSMEs are not homogeneous, as the magnitude of the relationships among examined variables are not identical across the three distinct size groups, comparable to findings from Cagliano, Blackmon and Voss (2001) and Khan, Lieb and Meiren (2011).

A summary of findings for each of the hypotheses is reported in Table 8.

[Insert Table 8 About Here]

5.2 Managerial Implications

Our findings also have direct implications for practitioners as the research provides valuable insights for managers into the importance of SSDPs to service MSMEs and the extent to which they are useful for enhancing their performance. The results indicate that small service organizations will benefit by introducing standardized processes to support the development of new services. Their meaning for the management of small service businesses is clear, they should review how their organization develops services and allocate adequate time and resources to the implementation of standardized NSD processes that are suitable for their organizational context. These will increase the reliability and predictability with which they

are able to introduce new services and allow them to increase the overall performance of their organization.

5.3 Limitations and Future Research

Although this study has its merits, like any other, it also has some limitations. First, our results are limited as cross-sectional, multisectoral data from Irish service MSMEs were used. As they provide only a snapshot of examined variables at a single moment in time, potentially fruitful future research directions would be the use of a longitudinal study to obtain richer insights; a replication or extension of this study that examines the same relationships in other national contexts, such as developing economies; or explores differences in these relationships between small and large organizations or among those in a single sector.

Further, the sample of firms used for this research was not drawn randomly, but from the databases of an academic research group. Therefore, though this sample was composed of a cross-section of organizations and not of those with superior or poor performance, the generalization of results should be done with caution.

Finally, while this research constitutes a novel exploration of new service development performance, it does not take into account the type of NSD pursued by firms. More complex, radical innovation projects may benefit more from standardized NSD processes than incremental innovations, where services are not altered substantially. Though outside of the scope of this paper, this presents an interesting direction for future research.

We hope that this paper will stimulate new ideas and research that can build upon or augment this study.

Appendix A

NSD Performance (Yang, Lee and Cheng, 2016) (α = 0.947)	
Please indicate the extent to which you agree with the following statements.	
NSD1	The speed of our new service development projects is very fast.
NSD2	Our organization's new service development program has been very successful at meeting customer' requirements.
NSD3	Our organization's new service development program has been very successful at meeting profit objectives.
NSD4	The performance of our organization's new service development program is better than that of our competitors.
NSD5	Our organization's new service development program leads to future opportunities.
Organizational Performance (Li and Atuahene-Gima, 2001) (α = 0.88)	
In comparison to your principal competitors, rate your firm's performance over the last three years on:	
OP1	Return on investment.
OP2	Return on sales.
OP3	Profit growth.
OP4	Return on assets.
OP5	Overall efficiency of operations.
OP6	Sales growth.
OP7	Market share growth.
OP8	Cash flow from market operations.
OP9	Firms' overall reputation.
Standardized Service Development Processes	
Do you have standard processes for the development of new services?	
	No (0)
	Yes (1)

Table A.1: Measurement Items

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