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Assessing Global Satisfaction of Portuguese Expatriate Workers using PLSc-SEM

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Abstract. The impacts of globalization and changes in the paradigms of the international workforce have led to an increasing trend in the number of expatriates (either those who do so by decision of the company for which they work, or those who do so on their own initiative). This reality applies to Portuguese expatriate workers, with positive and negative points for the development of their career and personal life. For a better understanding of this phenomenon, a survey was carried out using a questionnaire (validated in previous studies) with manifest variables expressed in a Likert-type scale of seven categories, which resulted in a sample of 207 observations. We used the Structural Equation Modeling (SEM) to study the relationship between the available latent variables and we applied the consistent Partial Least Squares (PLSc) estimator, which provides a correction for estimates and retains some of the advantages of the traditional PLS, to estimate the proposed reflective model. The results obtained show that for Portuguese expatriate workers the *Personal Satisfaction* and *Satisfaction with Destination Country* have a statistically significant direct effect on their *Global Satisfaction*.

INTRODUCTION

The phenomenon of professional mobility of individuals (either on their own initiative or on the initiative of the companies where they work) has grown exponentially, driven by technological advances combined with the globalization process. New forms of migratory flows have emerged to face new realities and in the last 30 years the number of international migrants has increased from 75 million to 200 million, requiring particular strategies, both in terms of legal and business management. New trends in the labor market often require well-prepared and talented individuals, able to be exposed to different businesses, markets and ideas, as well as to promote interaction with different cultures through international missions [1]. Companies know that individuals with international experience have superior social skills and that network resources improve problem-solving skills, so they often send their workers to work in other countries to acquire another professional experience. This theme has become increasingly important, both in the academic and business fields, given that the increasing complexity of individual objectives and the “unsatisfied” character of the human being, in the constant search for “something more” is associated with the idea that high personal and professional satisfaction leads to increased productivity, low absenteeism and low turnover. The global satisfaction of individuals is then dictated by the existence of intrinsic and extrinsic factors arising from personal and professional satisfaction, which are manifested in life events and in the characteristics that these expatriate workers face [2, 3, 4]. In this study we used Structural Equation Modeling (SEM) with the main objective of exploring and confirming the relationships between the latent variables/constructs (not directly measured) available in the applied questionnaire: *Personal Satisfaction (PS)*, *Job Satisfaction (JS)*, *Satisfaction with Destination Country (SDC)* and *Global Satisfaction (GS)* of the Portuguese expatriate workers. We propose a reflective theoretical model, supported by the scientific literature [5, 6, 7] and based in our experience on the subject. The six-research hypothesis under test are:

H1: *JS* has a positive impact on the *PS*

H2: *JS* has a positive impact on the *SDC*

H3: *JS* has a positive impact on the *GS*

H4: *PS* has a positive impact on the *GS*

H5: *SDC* has a positive impact on the *PS*

H6: *SDC* has a positive impact on the *GS*

Material and Methods

A survey was conducted through a validated questionnaire with more than 70 questions and used in some previous studies on the topic [6, 7], in order to understand the Portuguese workers' perceptions about their satisfaction with expatriation (implicit in their responses). The data were collected from January 22 to April 30, 2020, through an online questionnaire made available to a target population of Portuguese expatriates, on their own initiative or on the initiative of their employer. The questions correspond to ordinal manifest variables (or indicators), directly measured on a 7-point Likert scale (assumed equally spaced and perceived as symmetrical), which in this study were considered as operationalizing the latent variables in Table 1. Some empirical distributions of the manifest variables are leptokurtic and skewed (which is actually a very common situation when we work with people's perceptions), so the primary data we have available is nonnormally distributed. We considered the data as approximate to an interval-level measurement and then we applied the consistent Partial Least Squares (PLSc) algorithm, that performs a correction of reflective constructs' correlations to make results consistent with a factor-model [8, 9, 10, 11], available in the SmartPLS® software (v. 3.3.2) [12].

TABLE 1. Latent variables, some indicators (each coded from 1 to 7) and questions available on the questionnaire.

Latent variable	Indicator	Question available
<i>Job Satisfaction</i> (JS)	JS_11	I can always count on the company I am linked to in any situation
	JS_13	With this experience I acquired and developed other skills at a professional level
<i>Satisfaction with Destination Country</i> (SDC)	SDC_1	I like this culture
	SDC_3	I like to learn about this Culture
	SDC_9	I totally identify with the local culture
<i>Personal Satisfaction</i> (PS)	PS_9	I often visit the home of local friends
	PS_12	My quality of life has increased since I came here
	PS_14	Everything I do here gives me more pleasure
	PS_17	I am a better person with this experience
	PS_19	With this experience, I learned to respect more cultural differences
	PS_21	I became more confident with this experience
	PS_24	This experience is very rewarding for me
	PS_26	I acquired greater capacity for resolution and adaptation to different situations
<i>Global Satisfaction</i> (GS)	PS_32	I became more cultured
	GS_6	I would repeat the experience in the same country
	GS_9	The prospects and expectations I had before coming, are being / have been exceeded, everything is much better
	GS_10	This experience is central to professional development, performance and growth

STATISTICAL ANALYSIS AND RESULTS

We collected a non-probabilistic sample of 207 Portuguese volunteers (no missing values), who work or have worked in 20 different countries. In the top 5 positions are: United Kingdom (19.8%); France (14%); Germany and Switzerland (both with 11.6%); Spain (10.1%) and Canada (9.7%). To characterize the sample we also considered the sociodemographic variables: age (43% lie between 30 and 39 years old); marital status (60% approximately, are single, and 21.3% are married) and academic level (38.6% are graduated, 31.4% have completed high school and 10.1% have a Master/PhD). A large part of the workers surveyed worked as Specialized Technicians (40.6%). There are 9.2% as a Senior Management, 2.4% as Middle Management and 2.9% as Directors. The remaining workers perform other functions. It should be noted that for 11.6% of the workers it was the company that took the initiative for mobility (expatriates) and 88.4% had their own initiative to embark on this way of work and life (self-expatriates).

In Fig. 1 we have the estimated model using the PLSc with the full dataset (the sample size available is not huge, but the number of observations is much larger than the minimum sample size of 68 observations recommended by the G*Power software, considering two predictors for the target latent variable *Global Satisfaction*, a significance level of 5%, a power of the test of 0.80 and a moderate effect size of 0.15). In Fig. 1 we have the outer loadings between the indicators (rectangles) and the latent constructs (circles), the coefficient of determination R^2 are displayed only in endogenous constructs and the standardized estimated path coefficients are between pairs of constructs, allowing us to determine the relative importance of one construct to explain another.

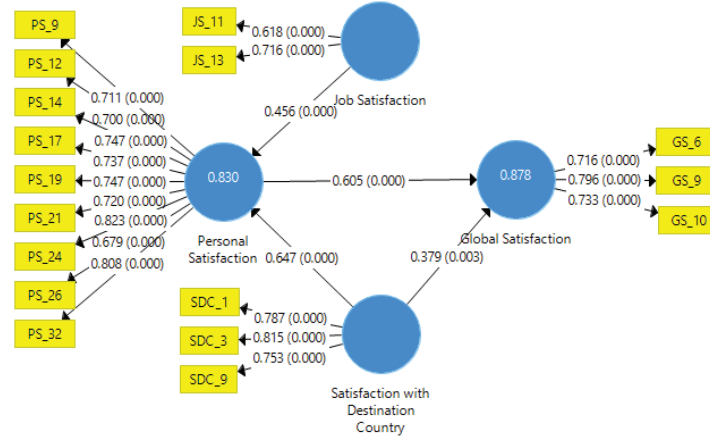


FIGURE 1. The reflective estimated model using the PLS algorithm, with the full dataset. In front of the outer loadings and the path coefficients are, in parentheses, the p -values obtained with the application of the bootstrap resampling method.

The structural equations of the estimated model can be written as,

$$\begin{cases} \text{Personal Satisfaction} = 0.456 \text{ Job Satisfaction} + 0.647 \text{ Satisfaction with Destination Country} \\ \text{Global Satisfaction} = 0.379 \text{ Satisfaction with Destination Country} + 0.605 \text{ Personal Satisfaction} \end{cases}$$

Evaluation of Results Based on the Application of PLS-SEM

To evaluate the model results we considered the rules of thumb available in literature that serve as broad guidelines [8, 9, 10, 11]. We also use the bootstrap resampling procedure (Bias-Corrected and accelerated – BCa) and to ensure the stability of the results we considered the recommended number of 5000 subsamples, with the size of the original sample [11]. Thus, we obtained 95% bootstrap BCa confidence intervals (CI), t -Statistics and p -values. For assessing the reflective outer (measurement) model we started to examine the outer loadings and in Fig. 1 only 3 (out of 17) have loadings slightly below 0.708, but all of them are statistically significant (with p -values $\approx 0.000 < 0.01$). About internal consistency reliability ρ_A was considered and only the value 0.622 (*Job Satisfaction*), presented in Table 2, is slightly below the threshold 0.7. In fact, the lower bound of the 95% BCa CI is also smaller than 0.7, but all ρ_A values are statistically significant with p -values < 0.01 , indicating reliable construct scores. Consequently, for the convergent validity, only the AVE (average variance extracted) value of the *Job Satisfaction* is smaller than 0.5, but all AVEs are significant (p -values < 0.01), indicating that the constructs explain at least 50% of the indicator's variance.

TABLE 2. Dijkstra–Henseler's ρ_A , Average Variance Extracted (AVE), 95% bootstrap BCa CI and p -values of both.

Latent construct	ρ_A	2.5%	97.5%	p_{ρ_A} -value	AVE	2.5%	97.5%	p_{AVE} -value
<i>Global Satisfaction</i>	0.795	0.701	0.862	0.000	0.561	0.436	0.677	0.000
<i>Job Satisfaction</i>	0.622	0.465	0.735	0.000	0.447	0.299	0.567	0.000
<i>Personal Satisfaction</i>	0.919	0.879	0.944	0.000	0.551	0.439	0.654	0.000
<i>Satisfaction with Destination Country</i>	0.830	0.734	0.889	0.000	0.617	0.482	0.725	0.000

In Table 3 we have all the HTMT (Heterotrait-Monotrait ratio) values below 0.9, except one which is slightly above, but no one of the correspondents 95% CI contain the value 1. Thus, we considered that the discriminant validity is present and the constructs are empirically distinct.

TABLE 3. Heterotrait-Monotrait ratio (HTMT) with the 95% bootstrap BCa CI.

Relationship	HTMT	2.5%	97.5%
<i>Job Satisfaction</i> $\rightarrow$ <i>Global Satisfaction</i>	0.622	0.302	0.888
<i>Personal Satisfaction</i> $\rightarrow$ <i>Global Satisfaction</i>	0.908	0.737	0.998
<i>Personal Satisfaction</i> $\rightarrow$ <i>Job Satisfaction</i>	0.682	0.369	0.905
<i>Satisfaction with Destination Country</i> $\rightarrow$ <i>Global Satisfaction</i>	0.871	0.732	0.972
<i>Satisfaction with Destination Country</i> $\rightarrow$ <i>Job Satisfaction</i>	0.344	0.111	0.579
<i>Satisfaction with Destination Country</i> $\rightarrow$ <i>Personal Satisfaction</i>	0.801	0.692	0.882

To assess the inner (structural) model we started with the overall fit of the model and since we used the PLSc estimator the standardized root mean square residual (SRMR) was considered. We used the SRMR, the Euclidean squared distance (d_{ULS}) and the geodetic distance (d_G) as the approximate fit measures, to obtain empirical evidence for the proposed model and the postulated theory [8]. In Table 4 we can see that the SRMR is 0.065 (for the saturated and estimated models), which is less than the threshold 0.08, indicating an acceptable model fit. Although all the discrepancy measures were above the 95% quantile they were below the 99% quantile (for the saturated and estimated models), indicating that the estimated model is not rejected at a 1% significance level.

TABLE 4. Fit summary of the saturated and estimated models.

Discrepancy	Saturated model	Quantiles		Estimated model	Quantiles	
		95%	99%		95%	99%
SRMR	0.065	0.056	0.073	0.065	0.056	0.075
d_{ULS}	0.638	0.415	0.669	0.649	0.432	0.658
d_G	0.864	0.582	0.876	0.867	0.573	0.897

The the coefficient of determination, R^2 , measure the variance explained in the each of the endogenous constructs (can be consider a measure of the model's explanatory power and is also referred to as in-sample predictive power [10]). In Fig. 1, both values are substantial (higher than 0.75), certainly due to the fact that the phenomenon under study is well understood. In the context of social and behavioral sciences, they can be considered outstanding values (0.830 for *Personal Satisfaction* and 0.878 for *Global Satisfaction*). To assess the PLSc path model's predictive accuracy we considered the values of Q^2 (this measure combines aspects of out-of-sample prediction and in-sample explanatory power, [10]). For *Personal Satisfaction* and *Global Satisfaction* constructs the obtained values of Q^2 are both positive higher than 0.25 (0.358 and 0.452, respectively), indicating medium predictive relevance.

We used the novel PLSpredict procedure to assess the model's out-of-sample predictive power, using a holdout sample [10]. We examined the prediction errors for all endogenous constructs' indicators, with *Global Satisfaction* being the model's key endogenous construct (Table 5). First, we evaluated the Q^2 predict statistic and all PLSc predictions outperform the most naïve benchmark (which is a linear regression model – LM as recommended in the literature [10]), defined as the indicator means from the analysis sample. To compare the PLSc predict with the LM predict values, we considered the popular prediction metric root mean squared error (RMSE) and also the mean absolute error (MAE). Once a minor number of indicators (only one in three) in the PLSc-SEM analysis yields higher prediction errors compared to the naïve LM benchmark, in terms of RMSE and MAE (Table 5), we may say that the model has a medium predictive power.

TABLE 5. Predictive performance of the PLSc model vs. benchmark LM.

Key endogenous construct	Indicator	Q^2_{predict}		PLSc predict		LM predict		LM - PLSc	
		PLSc	LM	RMSE	MAE	RMSE	MAE	RMSE	MAE
<i>Global Satisfaction</i>	GS_6	0.431	0.394	0.989	0.667	1.021	0.705	0.032	0.038
	GS_9	0.370	0.325	0.791	0.591	0.818	0.602	0.027	0.011
	GS_10	0.341	0.391	0.872	0.657	0.838	0.618	- 0.007	- 0.039

Note: negative values shows indicators for which there is no improvement in predictive power of the PLSc model over the LM benchmark.

In Table 6 we have the VIF values (variance inflation factor) and as they are below 3 (soft cut-off value) we can consider that there are no inner collinearity problems. The structural path coefficients (that fall in the range -1 to 1) are all positive and statistically significant (p -values $\approx 0.000 < 0.01$, Table 6), where the smallest path coefficient value is between *Satisfaction with Destination Country* and *Global Satisfaction* (0.379) and the highest path coefficient is between *Satisfaction with Destination Country* and *Personal Satisfaction* (0.647). As we have standardized coefficients, when we increase, for example, *Personal Satisfaction* by one standard deviation, we increase *Global Satisfaction* by 0.605 standard deviations, keeping all other variables constant (*ceteris paribus* concept). The f^2 effect sizes in Table 6 are all larger (higher than 0.35), where the effect between *Satisfaction with Destination Country* exogenous construct and *Personal Satisfaction* endogenous construct is the highest (2.169). The *Job Satisfaction* has a positive direct effect (0.456) on the *Personal Satisfaction* and an indirect effect ($0.276 \approx 0.456 \times 0.605$) on the *Global Satisfaction* through the *Personal Satisfaction* (mediator construct). The *Satisfaction with Destination Country* has positive direct effects on *Personal Satisfaction* (0.647) and on *Global Satisfaction* (0.379). In fact, it has a total effect (= direct effect + indirect effect) of 0.77 (= 0.379 + 0.391) on *Global Satisfaction*. H2 and H3 are the only research hypothesis, defined in the introduction section, which are not supported by the sample data.

TABLE 6. Inner VIF values, path coefficients with the 95% bootstrap BCa CI and p -values. Effect sizes f^2 .

Relationship	VIF	Path coeff.	2.5%	97.5%	p -value	f^2
<i>Job Satisfaction</i> → <i>Personal Satisfaction</i>	1.134	0.456	0.261	0.689	0.000	1.078
<i>Personal Satisfaction</i> → <i>Global Satisfaction</i>	2.826	0.605	0.227	0.833	0.000	1.064
<i>Satisfaction with Destination Country</i> → <i>Global Satisfaction</i>	2.826	0.379	0.155	0.698	0.003	0.418
<i>Satisfaction with Destination Country</i> → <i>Personal Satisfaction</i>	1.344	0.647	0.390	0.833	0.000	2.169

Finally, to assess out-of-sample prediction without using a holdout sample we used the Bayesian information criterion (BIC) [10]. This metric can be used to compare different model configurations and in this study the model for the target construct *Global Satisfaction* should be preferred since minimizes the BIC value (- 421.098), given that for the construct *Personal Satisfaction* the BIC value is - 351.447 (Table 7).

TABLE 7. Bayesian Information Criteria (BIC), model comparisons.

Endogenous construct	BIC (Bayesian Information Criteria)
<i>Global Satisfaction</i>	-421.098
<i>Personal Satisfaction</i>	-351.447

CONCLUSIONS AND FINAL REMARKS

The estimated model showed that *Job Satisfaction* is not as relevant as *Personal Satisfaction* and *Satisfaction with Destination Country* in explaining the *Global Satisfaction* of Portuguese expatriate workers. Although we cannot extrapolate these results to the population (due to lack of representativeness, as the available sample was not randomly collected), some of the main conclusions are in line with those obtained in previous studies. We hope that they can be seen as an important contribution in the professional sphere to a better understanding of this increasingly current social phenomenon. And that can help to draw guidelines on the processes inherent to the individual, insofar as they enhance their development and integration, culminating in more satisfactory results to all stakeholders.

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