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Personality, Risk and Financial Planning: A Consigned Credit Analysis

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Abstract

This article examines Brazilian Navy personnel's psychological and behavioral characteristics in the context of credit risk, the consigned credit, utilizing multiple linear regressions and correspondence analyses. Incorporating personality traits through the Big Five model, the research considers various sociodemographic and military characteristics. The payroll-deductible loan sample comprises individuals with high financial planning and above-average or high-risk tolerance. This research contributes novel insights by integrating personality traits as determinants of military indebtedness, financial planning, and risk tolerance. The study reveals that the personality trait "openness to experience" positively impacts financial planning, indicating a tendency toward financial discipline. Women, older individuals, and those with less service time exhibit a riskier financial profile. The research identifies a lack of basic financial knowledge among indebted military personnel, underscoring the need for interventions to address this issue. Financial planning and risk tolerance are critical factors influencing decisions, reflecting broader societal challenges of increasing indebtedness and financial illiteracy.

JEL classification numbers: D14, G21, G32.
Keywords: Credit Risk, Personality Traits, Risk-taking, Consigned Loans, Military Personnel in Brazil.

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1. Introduction

According to data from the Brazilian Central Bank (BACEN, 2018), public servants are the largest borrowers of payroll-deductible loans, representing 2018 56.2% of the total number of borrowers. In the context of the military, more specifically in the Brazilian Navy, the Navy Personnel Payment Department presented a study on the indebtedness of military personnel and pensioners in August of that year.

The significant increase in loan contracts by the Brazilian Navy's military personnel influences this work. It is worth mentioning that the Navy authorized, in December 2017, the increase in the maximum term for payroll-deductible loans from 48 to 72 months. This fact allowed the dilution of the plots and, consequently, increased the military's consignable margin (PAPEM, 2017).

Considering an activity where its members follow rules that strictly guide their behavior and actions inside and outside the Headquarters, acquiring debts that are impossible to pay is considered a disciplinary transgression, provided for in regulations. Articles 36, 37, and 38 of the Disciplinary Regulations for the Navy (RDM) provide for the following transgressions of a disciplinary nature: incurring debts or assuming commitments beyond their possibilities, compromising the good name of the class; avoiding moral or pecuniary commitments; and not heeding a superior's warning to satisfy debt already claimed.

These attitudes are passive from punishment, harming soldiers' careers. Such articles indicate that the hierarchy goes beyond the headquarters' walls and enters the military's intimacy. There is no way to separate personal problems from professional problems. A person facing financial problems is vulnerable to reflecting on this situation in their work environment, compromising their health and performance (Zerrenner, 2007).

In this context, considering the importance of understanding the indebtedness of the military in the Brazilian Navy, this study focused on consigned credit. In the proposal of this work, the objective was to analyze psychological characteristics of personality traits (the Big Five test based on Rammstedt and John 2007), as well as behavioral risk-taking issues according (Grable and Lytton 1999), financial planning (Shelton and Hill 1995) and sociodemographic and military characteristics. For this, we developed multiple regressions in which risk tolerance and financial planning were dependent variables. In addition, we use the multivariate multiple correspondence test to search for associations that could contribute to the explanation of the phenomenon. We use online questionnaires sent to active-duty military personnel at the Naval base in Niterói-RJ.

We divided this study: in the second section, issues about indebtedness (over-indebtedness, consigned credit, and practical credit issues) as well as risks and uncertainties in finance (addressing decision-making and financial planning), personality traits and previous studies; in the third section the methodology used in this work will be presented in detail; in the fourth section, we present the results found with discussion with related literature; and the fifth section concludes the study by pointing out final considerations and suggestions for future research.

2. Theoretical Framework

2.1 Indebtedness and Consigned Credit in Brazil

Many people interpret the term "indebted" from the perspective of "delinquent." However, as emphasized by the chief economist of the Credit Protection Service in Brazil (SPC), (Kawauti, M. 2016), the installments still need to be due for any acquisition that constitutes debts assumed by the consumer. The accumulation of debts can lead to the impossibility of payment, thus resulting in a situation of default. Therefore, being in debt is related to the decision to assume liabilities and not to the decision to exempt oneself from paying debt installments.

Law No. 1046 of 02 January 1950 regulates consigned credit in Brazil, allowing only deductions from the payroll of active civil servants, retirees, and pensioners (Brazil Law Nº 1.046, 1950). However, before establishing the general rules on payroll-deductible credit, only public institutions could offer this modality to their employees, limiting the period for paying off the debt to forty-eight months.

Law No. 8,112, of 11 December 1990, made the payroll-deductible loan for federal public servants more flexible. It established that: "With the authorization of the server, there may be consignment loan in the paycheck in favor of third parties, at the discretion of the administration and with cost replacement, as defined by regulation" (Brazil Law Nº 8.112, 1990). From then on, the government authorized consignment in favor of third parties.

Currently, the public server can commit up to 35% of the monthly income with discounts, 30% in the loan itself, and 5% in the form of withdrawals from the payroll-deductible credit card. According to Law No. 2015, this type of credit was allowed and expanded, obtained now from banks, insurance companies, or financial institutions. The duration must be 96 months for federal civil servants and 72 months for the National Institute of Social Security (INSS) retirees and pensioners.

In the specific case of the military, Provisional Measure No. 2.215 of 2001 establishes in its Art. 14 § 3 the limit concerning the percentage of military salaries discounted. "In the application of discounts, the military cannot receive an amount less than 30% of their remuneration or earnings." (Brazil. Provisional Measure 2.215-10, 2001). Therefore, 70% of the remuneration may be subject to discounts.

Military discounts are classified into: mandatory and authorized (Brazil. Provisional Measure 2.215-10, 2001). The income tax deduction, military pension, medical assistance plan, payment of alimony, and the fee for national residential use are mandatory. On the other hand, the military classifies payroll-deductible installments as authorized discounts. It is important to note that the mandatory ones have priority over the authorized ones.

Despite the authorized discounts accounting for 70% of the discounted salaries, the minimum receipt is restricted to only 30% of the remuneration. This allows the military to make available consigned discounts almost double the percentage that other categories of general public service have (35%). Due to mandatory discounts, allocating the 70% available is impossible.

In addition to a new contract, the consignor has two other options: refinancing, with a new term and even an additional credit, and debt portability. According (BACEN, 2018), loans can be paid off, in whole or in part, before the term originally contracted through the so-called "early settlement," with a proportional reduction in interest and other charges. The Consumer Defense Code guarantees this right. Early settlement can be done with one's resources and through the transfer of resources from another bank, a procedure known as debt portability.

2.2 Risks, Uncertainties and Financial Planning

For (Pritchard 2014), the nature of a given risk comprises three essential elements: the event, the probability, and the severity. The event describes the potential risk, contemplating its generating source and effects; the probability, defined through calculations and statistical theories, presents the chances of the event's occurrence; and severity translates the impact generated if a specific risk materializes on the future objectives.

Risk perception refers to judgments made by individuals with cognitive and emotional biases (Bazerman, 2004), in addition to remaking the use of bounded rationality to adopt models based on their knowledge and experience to predict the future (Simon, 1963). Therefore, there is no way to exclude people from creating and using the risk methodology.

Decision-making is directly associated with decision-makers attitudes toward risk. Individuals make financial decisions by aligning their appetite for risk and the return it will bring. A decision's outcome results in a gain or loss based on a combination of strategies. The decision maker has no control over future events, but these events will undoubtedly affect the outcome of the individual's strategy.

Decision-making means choosing one alternative over others to solve a particular problem. Decision-making has a deep relationship with psychological factors, which studies how limited rationality impacts the decisions of individuals in different situations and their behavior in the face of financial decisions, such as financial planning (Lobão, 2012).

According (Gitman and Madura, 2003), long-term financial plans establish planned financial actions and the expected impact of these measures in periods ranging from two to ten years. Conversely, short-term financial plans establish short-term financial actions and the expected impact of these actions, covering a period of one to two years. Through financial planning, it is possible to establish realistic consumption goals and plan medium- and long-term acquisitions, such as acquiring a home or a vehicle or even planning trips and investments. However, to guarantee financial success, it is necessary to control earnings and expenses (Santos and Silva, 2014).

Personal planning is related to each person's goals in life and starts with personal strategic planning, in which each person defines what they want to be in one year, five years, ten years, and for the rest of their lives Cherobim and Espejo 2010). In addition, the (BACEN, 2018), states that "good personal or family financial planning starts with creating a reliable personal budget, which means forecasts with a satisfactory degree of accuracy."

2.3 Personality Traits

According (Gosling, et al. 2003), the model of the five personality traits is the most widely researched and used globally. It presents personality traits in five major dimensions to represent personality on a broader level. According Borghans, et. at. 2008), the model of the "Big Five Personality Traits" can be better understood through the characteristics and definitions of the five big traits, which are:

• Openness to experience/will to learn, which is the degree to which the individual needs intellectual impulse and is adept at change and variety;
• Conscientiousness is the degree that represents the person's level of concentration and their predisposition to comply with rules, standards, and norms;
• Extraversion, which is the degree to which a person needs attention and social interaction; amiability/socialization, which is the degree that measures pleasantness and harmony in relationships with other people; and
• Neuroticism is the degree to which a person experiences the world as a threatening environment beyond their control.

Table 1, based (De Bortoli, 2016), shows the significant traits and characteristics that generate high and low scores in the Big Five model.

Table 1: Five Great Personality Traits

Low Scores	Characteristics	High Scores
Practical, conventional, prefer routine.	Openness to Experience, Imagination, Feelings, Actions, and Ideas.	Curious, a massive variety of interests, independent.
Impulsive, careless, disorganized.	Conscientiousness, Competence, Obedience, Effort for Achievement, and Self-discipline.	Works hard, is reliable, and is organized.
Calm, reserved, withdrawn.	Extraversion, Sociability, Assertiveness, Positive Emotions.	Outgoing, warm, and adventure seeker.
Critical, uncooperative, suspicious.	Amiable, Cooperative, Reliable, and Humorous.	Helpful, confident, and empathetic.
Calm, even-tempered, and confident.	Neuroticism and tendency to unstable emotions.	Anxious, unhappy, and prone to negative emotions.

It is important to note that high scores are desirable for each trait, except for Neuroticism, as a lower score for this trait reflects a higher degree of emotional instability. These traits relate to the most fundamental characteristics of people, but each person has a different combination of the five personality traits, and there may be a trait that will stand out more than others; this does not mean that the others do not exist (De Bortoli, 2016 and De Bortoli, et al. 2019).
Costa, and McCrae (1985), devised the most comprehensive model to identify

personality differences found in each individual, called the NEO Personality Inventory (NEO-PI). The NEO-PI is an instrument that measures the five main personality domains and the six traits or facets that define each domain.
The NEO-PI's five domain and 30-facet scales, including the Agreeable and Conscientious domains, facilitate a comprehensive and detailed assessment of the average adult personality. However, applying this instrument took considerable time and was difficult to understand for many research purposes (Lima, and Simões, 2000).
To improve the previous model, (John, et al. 1991) created the Big Five Inventory (BFI), an improved version of the previous instrument. The significant contribution of this model is the creation of a scale composed of 44 items evaluated using a 5-point Likert scale, ranging from (1) "I totally disagree" to (5) "I totally agree. "Compared with the previous instrument, the BFI-44 allows the assessment of the five personality factors using short sentences and without great difficulties (De Bortoli, 2016).
Finally, an even more simplified model appears, the BFI-10. Created by Rammstedt and John (2007). The BFI-10 has, among the ease of operation, the brevity of its scale that has only ten items and the fact that two items represent each personality factor. The BFI-10 has an 82% correlation with more extended tests, and according (Miller, 2010), it is easy to answer - in one minute or less.

2.4 Main Related Studies

At the national level, (Pacheco, et al. 2018), investigated the aspects that influence the attitude toward indebtedness and financial knowledge, using the Federal University of Santa Catarina employees as a sample. The authors also considered the servers' profile aspects and personality traits.
The authors used a structured questionnaire sent by e-mail to the UFSC servers. In the data analysis, descriptive statistics of the profile and the researched factors were used, in addition to univariate analysis using the t-test and ANOVA and multivariate analysis using multiple linear regression. The results revealed a predominance of "conscientiousness" and "openness to experience," indicating that most employees have financial knowledge and thus do not present a favorable attitude towards indebtedness.
De Bortoli, et al. (2019), sought to understand which of the following procedures is more coherent for understanding the "real" profile of the investor in situations involving risk-based decisions: Investor Profile Analysis (API), prospect theory, and personality theory, through the Big Five Personality Test, and the Cognitive Reflection Test (CRT). The actual profile of the investor is a proxy, resulting from the performance of the economic agent (student) during a simulation of investments in a laboratory environment, which allows obtaining their risk acceptance.
The investor profile analysis (API) corresponds to the financial institution's obligation to verify the investor's profile before applying. Prospect theory seeks to assess violations of expected utility theory; personality theory (through the Big Five

Personality Test) presents personality traits in five significant dimensions, and the Cognitive Reflection Test (CRT) measures the cognitive ability of individuals.
Tavares, (2020), investigated how personality traits influence young university students' financial literacy in the metropolitan region of Goiânia-Brazil. To test the hypotheses, the author used a multiple linear regression analysis by Ordinary Least Squares (OLS) and, for the robustness test, an analysis using logistic regression based on the Generalized Structural Equations Model (GSEM logit).
The results showed conscientiousness and intellect as the most significant personality traits, as they positively affect the sample's financial literacy level, both in the OLS and the logistic regression based on the GSEM logit. In short, the more conscientious and intellectual people are the more significant their financial literacy level, or the more likely they are to be perceived. As a contribution, this work brought a current expectation of the effects of human personality on financial literacy, and by considering the logistic regression method by GSEM, the results showed that the conceptual model is robust.
De Lima Filho, et al. (2020) aimed to analyze the financial knowledge of professors from different areas of the Federal University of Alagoas (UFAL) by analyzing their preferences and decision-making. Thus, from the teachers' perception, they described characteristics alluding to their financial behavior.
According to the authors, respondents know the importance of having control over finances and debt management so that solvency is maintained and they do not become delinquent. However, even though deprived of the knowledge regarding the minimum perception of finances, they still need to practice the use of control and planning of credits and debits, allowing the lack of control to become a trigger in the acquisition of debts.
Through an empirical study, Rahman, et al. (2020), examined the influence of behavioral and demographic factors on indebtedness by constructing a model based on specific determinants. The experimental method is used through partial least squares (SmartPLS), surveying 320 respondents. In addition, a self-administered questionnaire was administered to respondents, addressing demographic and behavioral factors.
The results confirmed that among the determinants, risk perception had a highly significant relationship with materialism and emotion, while indebtedness had a relationship with emotion and materialism. The results also indicated significant differences between indebtedness and behavioral factors based on gender, marital status, age, income, and dependence on credit cards and loans. The results can help several economic actors design better models of credit supply and face credit problems in the long term.
Lea, (2021), reviewed psychological studies of the actual use of credit, debt, and over-indebtedness, aiming to make policy recommendations that can reduce the damage caused by debt to individuals and society. The lines of research lead in similar directions, so the review ends with a consolidated list of recommendations. It pulls together the recommendations to allow easy cross-referencing between the final list and supporting evidence. It identifies who needs to act on them (for

example, poverty reduction, unnecessary labeling of financial support as a loan, and financial education for children).

Jansson, et al. (2023), analyze the banks' risk-taking in credit decisions and the influences of loan officers' personality traits and financial risk preferences. The authors find that the loan officers' credit risk-taking is associated with bank-contextual factors, directly with perceived organizational credit risk norms, and indirectly with self-confidence in assessing credit risk through attitude to credit risk-taking. A direct association is also found with personal financial risk preference but not with personality traits.

However, what differentiates this study from the previous ones is the fact that it analyzes the issues related to consigned credit, adding different aspects, such as: the individual's personality traits, the attitude to risk he presents, whether or not he has financial knowledge, and the reported profile characteristics.

Furthermore, some studies have already been carried out focusing mainly on students or teachers (Silva, et al. 2019); however, the reality of the military is unique since the specificities inherent to the military career and the socioeconomic contexts are also different.

3. Methodological Procedures

Sampling was non-probabilistic, as a perfectly random sample would be unlikely due to hierarchy and accessibility. The questionnaires were sent only after the authorization of the director of the Navy Personnel Payment Department. The inclusion criterion for the research participants was to be active in the Navy of any rank or degree and serve in the Naval Complex of Niterói-RJ.

A total of 404 responded to the questionnaire, 182 using consigned credit. For data collection, we use a questionnaire composed of 48 questions, developed with five blocks of questions:

1. Sociodemographic profile of the respondents.
2. Payroll-deductible loan, allowed to identify the characteristics of the loan.
3. Risk Tolerance - created by (Grable and Lytton 1999), made it possible to measure financial risk tolerance.
4. Financial Planning elaborated by (Shelton and Hill, 1995), used in the evaluation of a person's financial behavior to the family income budget.
5. Big Five Inventory - adapted by (Rammstedt and John, 2007), allowed the identification of the personality traits of the military (it is noteworthy that this scale presents a correlation of 82% with more extended tests of the Big Five).

We used SPSS 26 software for data analysis, in which we estimated descriptive statistics, mean difference tests, and multiple regressions. We utilized the frequency for the descriptive analysis of the military profile and the investigated factors (personality traits, financial planning, and risk tolerance). The mean difference tests used were the t-test and ANOVA, which made it possible to identify whether there is a relationship between personality traits, sociodemographic variables, military characteristics, and loan peculiarities used in the research, as well as the relationship between risk tolerance and planning financial situation and these same variables.

We adopted Multiple linear regression to test relationships between Financial Planning and the Big Five variables, in addition to sociodemographic variables, military characteristics, and loan peculiarities used in the research. We also tested the relationship between Risk Tolerance and these same variables.

Risk tolerance, Financial Planning, and personality traits are numerical variables, as well as gender, time working in the Navy, renegotiation of installments of payroll-deductible loans, and the number of loans; that is, a score or score represents these variables. On the other hand, the variables age, income, marital status and educational level, hierarchical level, number of installments, the amount discounted from the Paycheck, and other income sources are qualitative or categorical.

The multiple linear regression model was used to examine the effect of all independent variables on the dependent variables (Risk tolerance and Financial Planning). We use dummy variables to make it possible to include qualitative or categorical variables in the analysis.

We developed ten multiple linear regression models, and the following equations represent their formulas. Models 1 and 2 regressed only the Big Five variables concerning risk tolerance and financial planning.

$$Y_{\text{Risk Tolerance}} = \alpha + B1X_{\text{Opening for New Exp.}} + B2X_{\text{Conscientiousness}} + B3X_{\text{Emotional Stability}} + B4X_{\text{Extroversion}} + B5X_{\text{Amiability}} + \varepsilon \quad (1)$$

$$Y_{\text{Financial Planning}} = \alpha + B1X_{\text{Opening for New Exp.}} + B2X_{\text{Conscientiousness}} + B3X_{\text{Emotional Stability}} + B4X_{\text{Extroversion}} + B5X_{\text{Amiability}} + \varepsilon \quad (2)$$

Models 3 and 4 regressed only the sociodemographic variables (gender, age, income, marital status, and educational level) concerning risk tolerance and financial planning.

$$Y_{\text{Risk Tolerance}} = \alpha + B1X_{\text{Sex}} + B2X_{\text{Age}} + B3X_{\text{Income}} + B4X_{\text{Marital Status}} + B5X_{\text{Educational Level}} + \varepsilon \quad (3)$$

$$Y_{\text{Financial Planning}} = \alpha + B1X_{\text{Sex}} + B2X_{\text{Age}} + B3X_{\text{Income}} + B4X_{\text{Marital Status}} + B5X_{\text{Educational Level}} + \varepsilon \quad (4)$$

Models 5 and 6 regressed only the variables of military characteristics (time working in the Navy and hierarchical level) concerning risk tolerance and financial planning.

$$Y_{\text{Risk Tolerance}} = \alpha + B1X_{\text{Working time in the Navy}} + B2X_{\text{Hierarchical Level}} + \varepsilon \quad (5)$$

$$Y_{\text{Financial Planning}} = \alpha + B1X_{\text{Working time in the Navy}} + B2X_{\text{Hierarchical Level}} + \varepsilon \quad (6)$$

Models 7 and 8 regressed only the variables of loan peculiarities (number of installments, renegotiation of installments of the payroll-deductible loan, amount discounted from the Paycheck, number of loans, and other sources of income) concerning risk tolerance and financial planning.

$$Y_{\text{Risk Tolerance}} = \alpha + B1X_{\text{Number of Installments}} + B2X_{\text{Renegotiation of Payroll Loan Installments}} + B3X_{\text{Amount deducted from Paycheck}} + B4X_{\text{Amount of Loans}} + B5X_{\text{Other Sources of Income at Home}} + \varepsilon \tag{7}$$

$$Y_{\text{Financial Planning}} = \alpha + B1X_{\text{Amount of Loans}} + B2X_{\text{Renegotiation of Payroll Loan Installments}} + {}_{\text{Amount deducted from Paycheck}} + B4X_{\text{Amount of Loans}} + B5X_{\text{Other Sources of Income at Home}} + \varepsilon \tag{8}$$

Models 9 and 10 regressed all previous risk tolerance and financial planning variables.

$$Y_{\text{Risk Tolerance}} = \alpha + B1X_{\text{Opening for New Exp.}} + B2X_{\text{Conscientiousness}} + B3X_{\text{Emotional Stability}} + B4X_{\text{Extroversion}} + B5X_{\text{Amiability}} + B6X_{\text{Sex}} + B7X_{\text{Age}} + B8X_{\text{Income}} + B9X_{\text{Marital Status}} + B10X_{\text{Educational Level}} + B11X_{\text{Working time in the Navy}} + B12X_{\text{Hierarchical Level}} + B13X_{\text{Amount of Loans}} + B14X_{\text{Renegotiation of Payroll Loan Installments}} + B15X_{\text{Value Deducted from Paycheck}} + B16X_{\text{Number of Installments}} + B17X_{\text{Other Sources of Income at Home}} + \varepsilon \tag{9}$$

$$Y_{\text{Financial Planning}} = \alpha + B1X_{\text{Opening for New Exp.}} + B2X_{\text{Conscientiousness}} + B3X_{\text{Emotional Stability}} + B4X_{\text{Extroversion}} + B5X_{\text{Amiability}} + B6X_{\text{Sex}} + B7X_{\text{Age}} + B8X_{\text{Income}} + B9X_{\text{Marital Status}} + B10X_{\text{Educational Level}} + B11X_{\text{Working time in the Navy}} + B12X_{\text{Hierarchical Level}} + B13X_{\text{Amount of Loans}} + B14X_{\text{Renegotiation of Payroll Loan Installments}} + B15X_{\text{Value Deducted from Paycheck}} + B16X_{\text{Number of Installments}} + B17X_{\text{Other Sources of Income at Home}} + \varepsilon \tag{10}$$

The models underwent some tests to ensure reliability and reduce the analysis's uncertainties and mitigate possible errors. After performing the chi-square test to standardize the frequency values and form the basis for the associations, we used multiple correspondence analysis, offering a simplified view of which variables have a particular association level and which do not.

4. Results and Data Analysis

We observed that to the predominant profile, the majority of respondents, 53.70%, belong to the male sex; 37.60% have an age range between 25 and 35 years; 51% are married; 50.50% have dependents; 46.80 have only secondary education; 36.60% are NCOs and Sergeants; 48% work in the Navy between 0 and 10 years; 35.90% live in the rented property; 32.40% are in the range of 6 to 9 minimum wages. The servers who receive this remuneration are from the circle of NCOs and

Sergeants. Another income range with a high number of respondents (23.36%) is between 3 and 6 minimum wages; 55% do not use payroll-deductible loans.
After knowing the military's profile, we verified the respondents' personality traits using the Big Five scale proposed by (Rammstedt and John, 2007). Among the respondents, it was possible to observe some characteristics of the personality dimensions. In general, the answers indicate that most of the military interviewed are not reserved, are sociable and outgoing, tend to trust people, and are not critical of others. There was no consensus about laziness, but they insisted until they concluded a task or job.
We also found that in the questions related to Neuroticism (is relaxed, controls stress well) and (gets nervous quickly), the results presented were well distributed, with no consensus on the answers related to this dimension. Finally, most claim to have few artistic interests and a fertile imagination.
Table 2 shows the frequencies and percentages of each personality trait of the Navy personnel who responded to the survey, considering the orientation of (De Bortoli, 2016) in which: low (results less than 5), medium (results equal to 5), and high (results greater than 5).

Table 2: Personality Traits Test Results

Personality Trait	**Low (1)**	**Medium (5)**	**High (10)**
	Frequency	**%**	**Frequency**
Extroversion	72	39,56	14
Amiability	46	25,27	28
Conscientiousness	37	20,33	8
Neuroticism	54	29,67	28
Opening for New Exp.	49	26,92	14

The results show that the military surveyed in the sample predominantly has high personality traits. For example, of the military respondents, 75.27% showed high conscientiousness, indicating they are reliable, organized, cautious, and disciplined. In addition, 65.39% revealed a high openness to the experience, demonstrating that, in general, they are people with broad interests, liberal, curious, and like novelties.
Thus, it is possible to recognize that the Navy personnel who responded to the survey have a profile with a high score in conscientiousness and openness to experience, indicating focused and exploitative servers. At a moderate level, we noticed traces of Neuroticism and agreeableness. The dimension with the highest frequency of the low score was extroversion, showing that some servers are reserved.
We saw similar results in the study by (De Bortoli, 2016), with undergraduate students in Economics and Electrical Engineering at UFSC, in which participants showed high conscientiousness and openness to experience.
To understand the general performance of those surveyed about financial planning, the general we calculated the average of the military's score at this stage of the

questionnaire. As a result, the military reached a median of 113 points, equivalent to 70% of the possible points, a very positive percentage, indicating that most of the soldiers interviewed plan their financial lives. The result was in line with the study evidenced by the Organization for Economic Cooperation and Development - OCDE (2015), which emphasizes that Brazilians must have a culture and long-term planning, resorting to loans for survival.

Most respondents (61%) scored between 3 - 4, opting for "part of the time" and "always," respectively, in all questions, while only (39%) of the answers were "never" or " rarely," which correspond to the lowest scores (1 and 2) points respectively, in the general assessment. We noted that only five soldiers did not reach at least half of the possible points, representing 2.75% of the total respondents. A study carried out with public servants in the State of Rio Grande do Sul found similar results concerning the Financial Planning of those servants, where 70.1% planned themselves financially. In comparison, 29.9% had no financial follow-up (Peixoto, 2018). However, we observed different results in a study with university students in the metropolitan region of Goiânia-GO. According to the research of (Tavares, 2020), students of public and private Higher Education Institutions have low Financial Planning, representing approximately 55% of the sample.

We adapted (Grable and Lytton, 1999), scale for this study to explore risk tolerance. We chose it because it is simple to administer, has reasonably valid items, is easy to answer, provides a risk tolerance scale score, and is relatively current. The scores are: (0-9) low; (10-12) below average; (13-15) average; (16-18) above average; and (19-26) high.

The majority are cautious and prefer to invest their resources for 1 to 2 years. Furthermore, respondents rate their experience in the financial market as moderate. Also, most respondents prefer BRL$1,000 in cash or a 50% chance of winning BRL$5,000. However, a fine line divides respondents' opinions concerning associating uncertainty with risk. Furthermore, in terms of investment, they prioritize income generation.

We added the scores together, and the higher scores indicate a greater willingness to exercise a financial behavior in which there is a possibility of loss, that is, a risk-taker. These calculations made it possible to analyze whether the military has risk tolerance. According to the classification defined by (Grable and Lytton, 1999), it was possible to identify that 51.65% of the military have an above-average risk tolerance (31.87%) or high-risk tolerance (19.78%). We found similar results in the study by (Provenzano, et al. 2016) with the results in Table 3.

Table 3: Classification of Risk Tolerance Scores

Classification	Frequency	%
Low	15	8,24
Below Average	21	11,54
Average	52	28,57
Above Average	58	31,87
High	36	19,78
Total	182	100%

After these first disclosures, we sought to identify the relationship between the profile variables and the factors investigated. The results of the t-test and ANOVA are in Table 4.

Table 4: Results of the t-test and ANOVA for significant variables

Variables	Risk Tolerance		Financial Planning	
	Value	Sig.	Value	Sig.
B.F. (Opening for New Experiences)	0,078	0,605	0,391*	0,086
Sex	1,246**	0,038	0,804	0,479
Education Level 1	-3,301***	0,002	-3,174	0,120
Income 1 (Between 1 and 3 M.W.)	-5,110***	0,008	5,206	0,152
Income 2 (Between 3 and 6 M.W.)	-3,270*	0,063	7,720	0,022
Income 3 (Between 6 and 9 M.W.)	-3,065*	0,072	6,014	6,014
Hierarchical level 0 (Corporal and Sailors)	-4,813***	0,001	-3,071	0,258
Hierarchical level 1 (NCOs and Sergeants)	-2,651**	0,023	0,692	0,747
Amount of Loans	-0,557*	0,076	-0,126	0,857
Value Deducted from Paycheck 4 (Between BRL$2.001-BRL$2.500)	4,425*	0,093	-12,822	0,022
Value Deducted from Paycheck 5 (Between BRL$2.501-BRL$3.000)	4,423*	0,065	-6,529	0,281
*p<0.10; **p<0.05 and ***p<0.01				

Note. We excluded the following variables from the table that were not significant for the model: conscientiousness, emotional stability, extroversion, amiability, age, marital status, time working at M.B., renegotiation of payroll loan installments, and the amount discounted from payroll and other sources of income.

Analyzing the significant relationships for the financial planning factor, with the results of the t-test and ANOVA in Table 4, we observed that the variable from the Big Five test, "openness to new experiences," positively influences individuals' financial planning - indicating that the more independent and curious the individual is, the greater the probability of being also financially organized.

Subsequently, we investigated the variables relevant to the consolidation of risk tolerance. Sex has a positive influence, and according to data extracted from the research, most of the respondents are men (an explanation for this could be that men tend to take more risks), (Provenzano, et. al. 2016), found similar aspects.

Regarding the level of education, the variable negatively influences Risk Tolerance; the lower the level of education, the less likely the person is to take risks. The income range also influences Risk Tolerance, showing that the lower the income, the more a person tends to risk. Claudino, et al. (2009), state that some servers' high levels of education and income are predictable by the fact that these servers have more financial knowledge and resources and use them in their daily lives.

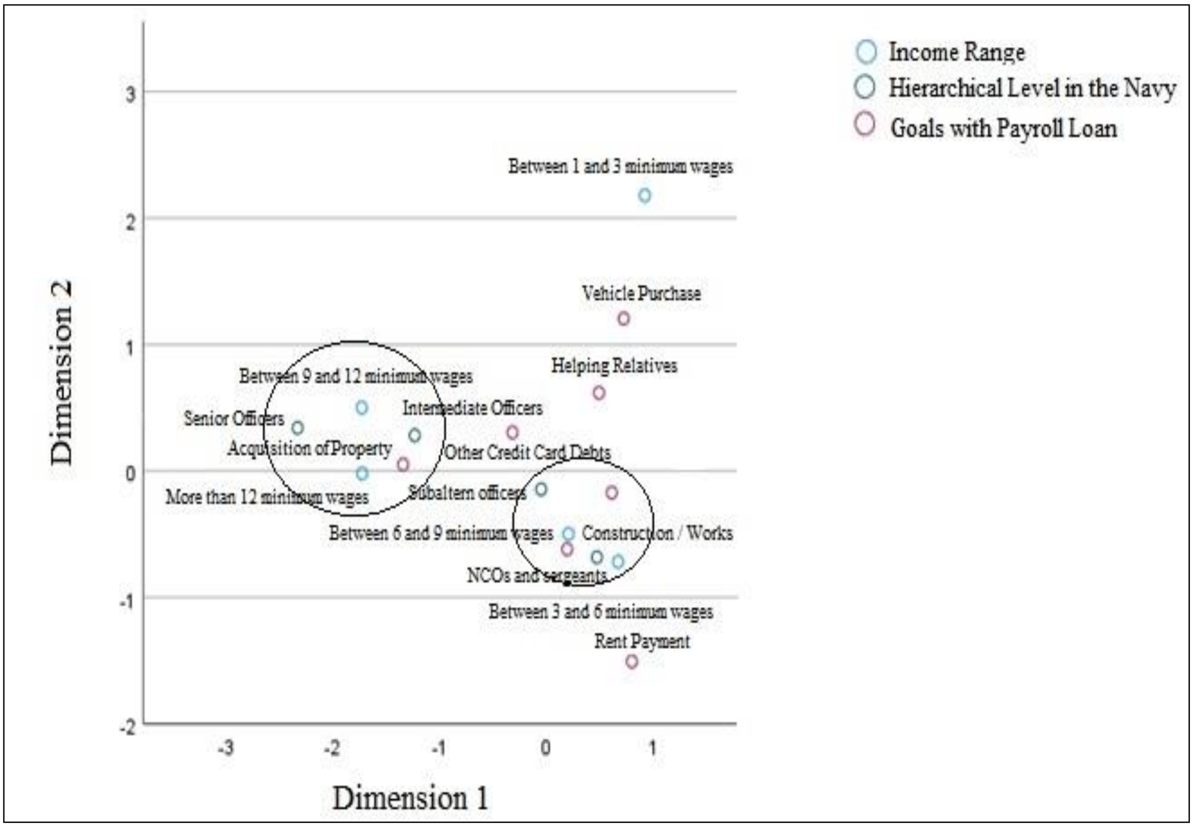
Still, based on the results obtained for the risk tolerance factor in the model of military characteristics, it was possible to observe a negative relationship between hierarchical levels 0 and 1, the lowest in the research, and risk tolerance, indicating that the lower the level hierarchy of individuals, they tend to take fewer risks.

For the model that analyzed the peculiarities of the loan concerning risk tolerance, the variables discounted amount on Paycheck four and amount discounted on Paycheck five referring to Payroll Loan had a positive influence (an explanation could be the distribution of the sample in medium and high levels of the survey).

In contrast, the number of loans had a negative influence (an explanation for this could be that 82% of the military reported having one or at most two loans; the majority had small amounts). For Lira, (2014), the large number of public servants who make loans and commit a significant part of their income without reflecting on the absolute need for the payroll loan (if the interest is abusive, if there are other built-in fees, and mainly, the consequences of this long-term budget loan).

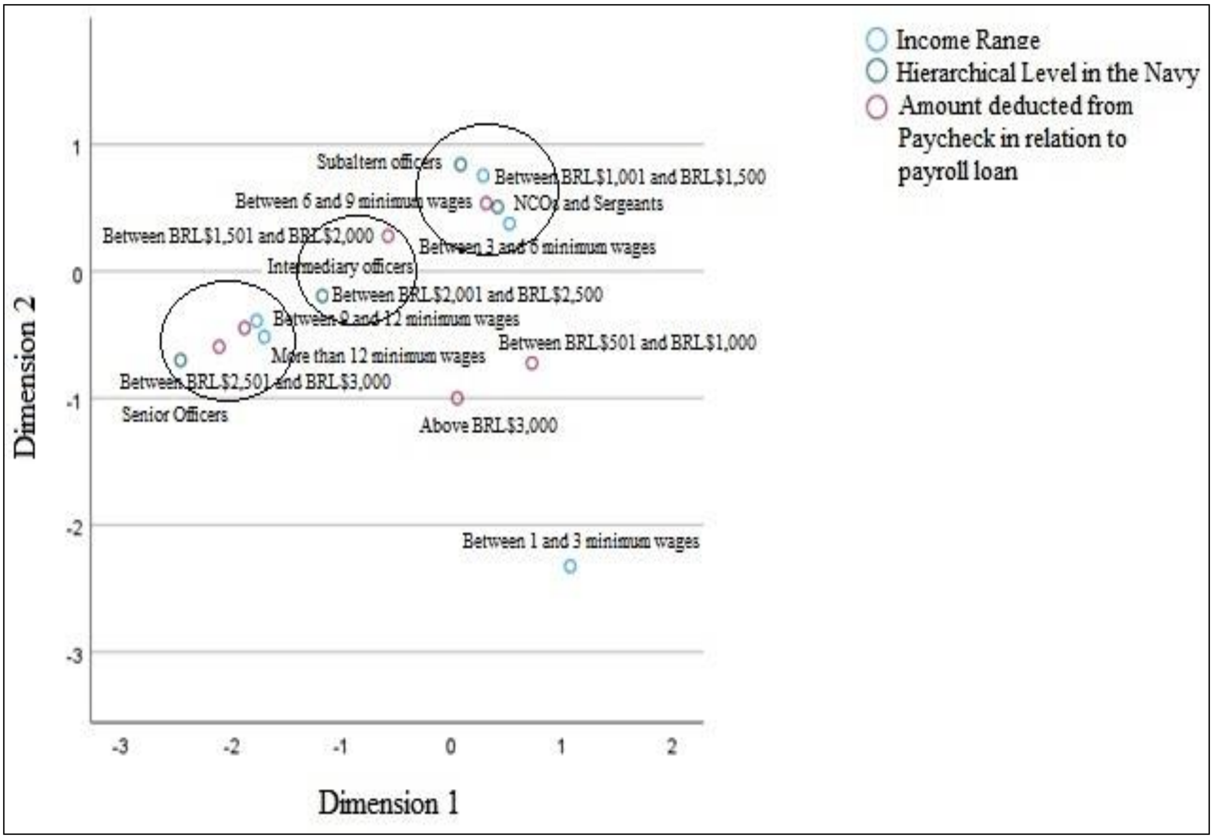
To measure the reliability of the construct, we use Cronbach's Alpha (α), which should be the first measure to assess the quality of an instrument (De Oliveira, and Oliveira, 2012). Reliability coefficients around 0.90 are excellent, and around 0.80 are very good. The authors emphasize that scores equal to or above 0.70 are considered satisfactory, but according (Hair, 2010), 0.60 is acceptable. In this study, we confirmed that in Risk Tolerance (α of 0.795) with seven questions, financial planning (α of 0.776) with fifteen questions, and personality traits (α of 0.702) with ten questions, all Cronbach's alphas were considered satisfactory, and consistent.

To verify the existence of an association between variables, two multiple correspondence analyses were carried out, initially between the variable "Objectives with the payroll-deductible loan," composed of the categories (Vehicle Purchase, Helping Relatives, Construction/Works, Payment of Rent, Credit Card Debts, Property Acquisition, and Others), and the variables "Hierarchical Level" (Captains and Sailors, NCOs and Sergeants, Subaltern Officers, Intermediate Officers, and Senior Officers) and "Income Range" (1 and 3 minimum wages, between 3 and 6 minimum wages, between 6 and 9 minimum wages, between 9 and 12 minimum wages and more than 12 minimum wages). The results are in graphs 1 and 2.



Graphic 1: Objectives with Payroll Credit vs. Hierarchical Level vs. Income Range

The objective "real estate acquisition" category strongly correlates with the highest income range categories, between 9 and 12 and more than 12 minimum wages and higher and intermediate official Hierarchical Levels. On the other hand, the categories "Credit Card Debts" and "Construction / Works" strongly correlated with income ranges between 3 and 6 and between 6 and 9 minimum wages; in addition, they are more closely related to the sub-officers’ hierarchical levels and Sergeants and Subaltern Officers.



Graph 2: Value Deducted from Paycheck vs. Hierarchical Level vs. Income Range

We noted that the categories Hierarchical Level of NCOs and Sergeants and Subaltern Officers present a strong association with the income ranges from 3 to 6 and between 6 and 9 minimum wages and with association with the value deducted from Paycheck between BRL$1,001 – BRL$1,500.

We also observed that the hierarchical category level of intermediate officers is associated with an income range between 9 and 12 minimum wages and the value deducted from Paychecks between BRL$2,001 and BRL$2,500. Finally, the hierarchical category level of senior officers is still very close to the income range of more than 12 minimum wages. Therefore, it is associated with the value deducted from Paycheck between BRL$2,501 and BRL$3,000.

5. Conclusion

The present study aimed to analyze the personality and risk traits of the Brazilian Navy soldiers concerning their indebtedness, mainly through consigned credit, aiming to contribute to a greater understanding of these characteristics and risk factors, which are associated with the high debt levels of the Navy's military.

In this work, we proposed new models for analyzing the Risk Tolerance and Financial Planning dimensions, with analyses involving personality through the Big Five model, the sociodemographic characteristics of the military, the characteristics of the military, the structural factors of the loan, and finally, a joint analysis.

For the sociodemographic profile, the sample is mainly represented by the male gender, between 25 and 35 years old, married, with dependents, with a complete high school education, who are in the institution in its first decade and have an individual income between 6 and 9 minimum wages. BRL$6,600.01 to BRL$9,900.00.

The sample profile using payroll-deductible loans was military personnel with high financial planning and an above-average or high-risk tolerance. For personality traits, the sample showed high personality traits for all five types.

It was demonstrated through regressions that the personality trait of openness to experience positively influences the financial planning of individuals, indicating that the more independent and curious the individual is, the greater the probability of being financially organized.

The independent variables "Openness to experience," "Gender," "Education Level," "Income Range," "Hierarchical Level," "Amounts of Loans," and "Value Deducted from Paycheck" showed statistically significant coefficients, confirming the relationship positive or negative personality, sociodemographic, military, and loan characteristics, and influence financial planning and risk tolerance.

One of the contributions of this study is incorporating personality traits as determinants of indebtedness, financial planning, and risk tolerance of the military, an aspect not investigated in previous studies with members of the Brazilian Navy. In addition, even though a large part of the military has high financial knowledge, there is still a need for finance training, which can provide knowledge and fundamental concepts that allow the military to make better financial decisions. The importance of this work is the possibility of extending these results to generate contributions in other naval complexes.

The research's limitations initially refer to the absence of a standardized instrument to assess the level of financial planning and risk tolerance, as there is to assess personality traits. In addition, different concepts are disseminated in the academic environment, which becomes problematic from evaluation to measurement.

For future studies, it would be interesting to evaluate the use of regional cultural aspects, including more armed forces such as the Air Force and the Army. Based on this study's findings, developing a multivariate analysis considering the relationship between constructs with different armed forces would also be interesting.

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