

## **The Financial Risk in SMEs-Case Study Applied to the City of Pereira**

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### **Abstract**

*The results of companies and their survival will depend on its ability to adapt to changes that presents the current environment, this fact leads to the necessary risk assessment as an inseparable element of business activity. In order to measure these risks and in particular the financial nature, are worked based on a sample of SMEs registered with the Superintendence of Companies Colombia, excluding those that are in the process of liquidation, the methodology consists of the calculation of financial indicators in order to understand the situation for each company and sector. Results showed that in the series of 2012 79% of the surveyed companies had financial risk based on the proposed model and the results were very similar to the results obtained with the series of 2011 where the total of 387 companies analyzed 80 % financial risk presented.*

**Keywords:** SMEs, Finance Risk, Liquidity, Indebtedness, Rotation Portfolio

### **Introduction**

Around the world, small and medium enterprises make up most of the business in terms of numbers "In Colombia, about 94% of the business system is comprised of SMEs, which remain the engine of the economy do not have the importance or needed to survive over time to support "(Aguirre Ortiz, et al, 2006), although this has begun to change as during" the past governments have established policies to promote the development of these enterprises through credit and other type of aid"<sup>4</sup>

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Due to the large percentage that these companies represent the concern arises from dig and know the risks they are exposed, in order to generate tools that allow them to act timely, since there are few studies in this field, and non-existent in the case analyzed in this work, particularly in the area of cash management, debt and portfolio management.

Similarly, the interest also arises because the SMEs often do not have (a priori hypothesis) with a financial department to conduct a full and proper monitoring of the different risk indicators and from it, and make appropriate decisions implement strategies leading to the mitigation of the risks that are embedded as indicated by Miller (1994).

This work aims to provide evidence that will enable companies to internalize the processes that serve to balance the results of the calculated indicators and have a controllable risk. According to Rodriguez et San Martin (2011) the current crisis has highlighted the close relationship among three inherent to the development of financial markets in recent decades aspects: the process of globalization, financial volatility and uncertainty magnitudes.

In this sense the subsectors of the economy in the geographic scope of this study (Risaralda) must be prepared for continuous improvement, so that helps them achieve a national and international economic growth, according to the negotiations are taking place in the context of globalization.

However, it is important to clarify that companies also need advice on other fields in order to make a diagnosis versus what is wrong with the organization, which makes its indicators may be in inadequate levels. That is, on many occasions you might find that the company should diversify their products and services to meet a demand that is being ignored and that generate higher return or value creation. The intention is that Finance can assist in the creation of value.

SMEs often have some adaptive advantage to quickly change its production structure in the case of changing market needs, which is often more difficult in a large company. So, TORO (2009 and 2012) mentions the following:

- Small businesses have more difficulty finding financing cost and reasonable time due to their increased risk and solve this resort to financial institutions.
- Companies are more labor rigidity and difficulty in finding skilled labor, so that the previous employee training is critical to them.
- Due to the small volume of benefits that present these companies cannot spend money on research, however, in many cases innovative processes and products.
- For their size, have a small customer base.

Other disadvantages of this type of organizations, as Beltrán (2004), are:

SMEs have great structural weakness for several main reasons:

- They lack strategy and planning, which becomes a limiting factor for inclusion in an international context and jeopardizes its continuity in the domestic market.
- It is difficult access to credit lines and therefore it is not possible technology investment, working capital and knowledge.
- The administrative, financial, accounting and operational management is very informal and intuitive.

Considering the above in SMEs and knowing your high degree of vulnerability faced the international market, they are considered as a case study, in order to contribute to its permanence in time. To test the hypotheses before the sample SMEs indicated they took in order to observe what is the behavior of financial risk in SMEs Pereira City series during the years 2011 and 2012 for this purpose, established a number of primary and secondary objectives as:

- Characterize the financial risk in SMEs in the city of Pereira.
- Debug the financial statements of SMEs studied.
- Determine liquidity ratios, leverage and loan recovery that are affecting the financial risk of a group of SMEs in Pereira.
- Establish the risk that companies own condition under study.
- Analyze the financial risk under the productive sectors for companies under study.

Similarly, before developing the work, he asked about studies that were related to the main objective. So include the study by Avila Bustos (2005), in the city of Bogota, called Measurement and control of financial risks in companies in the real sector. The author believes that there are three types of financial risks in organizations known as market risks, credit risks and liquidity risks, developed for each asides on the management, administration and measuring these risks being classically described by authors such as and Markowitz, Miller and Sharpe (1990), also taken up by Tudela and Young (2005) that is not structured for a comprehensive analysis, but has a view of them as individuals.

An important aspect of this study is that it recognizes the need for risk measurement in organizations and deepening and research in the management and administration thereof; to the point that it is considered to be a complementary to the development of social organizations object element.

In this context, also Zorrilla (2003) performed a study in the city of Veracruz (Mexico) on financial risk management in SMEs export contributions to the economy, which aims to guide and show the entrepreneurs the importance of the use of derivative financial instruments such as forwards, futures, options, swaps, to achieve the reduction in market risks.

This work focuses on these derivative financial instruments, for its ability to mitigate or reduce the risks faced by SMEs.

Another study is that of Navarro and López (2009) from the University of Seville, it is a proposal for a simplified model of entrepreneurial risk screening: empirical study applied to the construction sector (SMEs).

Its purpose is to identify the most significant variables or ratios of business solvency in construction companies by analyzing the financial statements of a sample of companies, a seamless continuity of activity (healthy companies) and others that are in a situation of bankruptcy or insolvency (failed companies), with the ultimate aim to propose a simplified method of detecting possible prior risk.

The author uses information about healthy companies and unsuccessful companies, taking into account economic and financial data for all companies, corresponding to the four years prior to business failure. The statistical technique used to reduce the variables that ultimately is incorporated into the multivariate analysis system. According to Ballesteros, the utility of the discriminant method lies in its ability to provide a comprehensive analysis model, consisting of a combination of ratios poorly correlated with each other, which summarizes the economic and financial information in a more digestible to the user.

The discriminant analysis also applies for predictive purposes. The main issue in the predictive application of discriminant analysis is to determine early enough business crisis situations. It is anticipated a catalog company as healthy or failed depending on the securities to be taking the ratios in the years before the crisis, through the application of discriminant functions built.

Hincapie (2007) in their study of financial risk analysis for micro, small and medium enterprises in the metalworking sector in the city of Manizales, performed a theoretical study unit of analysis similar to the object of this study, although with a different methodological model.

This study proposes to use the Z2, which is an econometric model that is constructed from financial ratio index. Such ratios are linearly combined with a specific weight for each, in order to obtain the final result a score (Z-score) which discriminates against companies defaulting on their commitments. The model was created by Altman (1968) for the prediction of bankruptcy.

The model uses the Altman discriminant analysis and multivariate statistical technique, it is a sequential process in which the analyst excludes those financial reasons that are not statistically significant and includes those that are.

The author considered that the above model, the measurement required to have risk factors as independent variables will enter as numerical variables that qualify each observation according to the company, the industry effect, the economic environment and meson the general environment. Thus the dependent variable of firm performance to be used is the calculation of Altman Z Model, known as probability of default. Therefore, on this view, the concept of risk is articulated with those factors that the internal or external size them negatively affect the company way. The positive impact make them pose as success factors and García Álvarez in 1996.

Under these approaches, it was considered appropriate to perform this work and that from the results presented companies can generate agreements through which they can design tools necessary for them to provide no-win situations for the company and perhaps in the short to medium term can be seriously affected or compromised. So, those are the signs that let you take the relevant decisions and act at the right time.

The aim is to provide a standard of support for decision-making, which is the cause that led to the search for new and better alternative solutions to organizational problems of SMEs, in order to respond to their needs.

An element that provides the design of this tool within their methodology is a comprehensive analysis of financial indicators to calculate, as they always are analyzed and evaluated individually in some organizations.

### ***Finance and Financial Risk***

In 1973 after the first oil shock to the present studies on the Science of Financial Management Company have expanded and deepened considerably. There are new lines of research and the Theory of Value Options, the Arbitrage Pricing Theory and the Theory of Agency.

In the eighties and nineties, are brilliant theoretical and methodological aspects of previous research, as well as the diversity of empirical validation, sophisticated pricing models and generalization of mathematical techniques and the use of Information.

Also, it delves into investigating current and Agency Theory and methodology provided by fuzzy sets theory applied to the Financial Subsystem in uncertain environment with significant results.

Interest is accentuated by the internationalization of the phenomena and financial decisions, leading to numerous studies on aspects such as political risk and the risk of variability of the exchange rates of the currencies in which the International Financial Management operates. Also, to overcome some criticisms of the CAPM has emerged ECAPM Porgue early work in an international context referred to pipeline companies, and later extended by Litzenberg, Ramaswamy and Sosin (1980).

Evidence on Risk Management hedges Hull (1980 - 2002); and subsequently Diaz de Castro & Mascarenhas (1994), Left (2004). Regarding, De Angelo and Masulis (1980) financial structure support the existence of an optimal financial structure considering the effects of taxes, depreciation and private investments of each company. Ross (1985) is pronounced in the same direction at risk and perfect market.

In connection with the dividend policy, the work is remarkable Jalilvand and Harris (1984), they conclude that market imperfections may involve interdependencies between investment decisions, financing and dividends. On the fiscal impact on the dividend policy Poterba and Summers (1984) concluded pronounced higher taxation of dividends versus capital gains. Moreover, Sarig and Scott (1985) are placed in a line similar to Dim, Lewellen and McConnell, reaffirming the phenomenon of different segments or clienteles on APT continue adding new research such as Roll and Ross (1980, 1984 ) I using multivariate analysis, the latter subject to critics like Dhrymes, Friend and Gultekin (1984).

It should be noted that during these years there have been studies between supporters of CAPM, as Tinic and West (1984,1986), and APT, Gultekin and Gultekin (1987, 1989) without reaching definitive conclusions about which of the two models is better, both in national and in the international version.

Wesseles and Titman (1989) verify the APT and conduct empirical research on capital structure, in arriving at conclusions such as that transaction costs may be an important determinant in the choice of capital structure, especially small companies to issue long-term financial instruments.

Leland (1994) in finding the optimal financial structure discovers that the value of debt and the optimal debt are explicitly connected with the risk of the business, taxes, bankruptcy costs, the type of risk free rate and payout ratios.

Fama and French in 1992 revealed important findings in this regard and conclude that the American market for non-financial firms a weak positive relation between averages return and beta is detected.

These same authors in 1995 trying to detect whether the behavior of asset prices in the previous ratio reflects the trend in profits. However, you do not get to final and satisfactory conclusions, much more research still needed.

Daniel and Titman (1997) reexamine the model of Fama and French. They argue that the features are more than the betas that determine the expected benefits.

Specifically, they find that stocks with low market-to-book ratios, but high betas with respect to the market-to-book portfolio factor, tend to have similar benefits to other low market-to-book stocks

Enrique Santana has published over the years numerous factors related to models of conditional heteroskedasticity applicable to other models such as ATP and PRICING OPTIONS ON ASSETS WITH WHITE NOISE RETURNS PREDICTABLE) or quadratic predictions and mean-variance analysis in models with conditional heteroskedasticity jobs and GARCH models.

In recent years there have been numerous articles and research done about the large presence of SMEs and their role in today's society. One example is the work done by Lopez Revuelta and Sanchez (1998) that purport to show, synthetic and globalized form, the specific problems affecting these family businesses. The same conclusions as interesting as that due to the family structure of the company, the criterion of maximizing the market value cannot be more appropriate in some cases are extracted. Other studies have delved into the study of human resource management in SMEs, funding, or direct investment in developing countries.

The theory of business valuation appeared stagnant, at least since the seventies and has only recently gained a significant boost under the influence of authors such as Cornell (1993), Copeland, Koller and Murrin (1995) and Damodaran (1996). O Fernández (1999) and Amat (1999) in Spain.

In the nineties, the theory and practice of business valuation was centered around something very classic and obsolete methods such as static approaches or balances and mixed models as the German and Anglo-Saxon. These methods seem outdated today, even admitting its virtuality and usefulness for small business valuation.

Currently, the methodology based on discounted cash flows seems indisputable and is the most consistent and solid in their theoretical foundations. By this line have claimed progress Martín Marín Trujillo and Ponce (2000) in his "Manual of the valuation of companies." Regarding the issue of new economy companies or virtual Internet-related economy these authors in their own words rather be a waiting period before addressing this thorny issue. These companies seem to escape the logic of the models developed to date valuation. The high volatility and seem exorbitant prices imposed on shares listed on the American NASDAQ.

Related to the above must take into account the increased value acquired by information and communication technologies within the company, factors that enable organizations to create value through the integrated physical and virtual chain management value. So believe Ordiz and Perez-Bustamante (2000) when they state that "these technologies can bring business benefits such as cost reductions or increases in value but for that, you should assume that investment in information and communication technologies is not a business decision, it acquires the status of strategic investment for the business, given the impact it might mean to the future of the same."

In recent years theories Risk Management have been considered as an interactive process based on knowledge, assessment and management of risks and impacts, whose main purpose is to improve decision making in organizations. Thus, on the basis of study on the cost of capital of Modigliani and Miller (1958), then the valuation models and risk regulation LÓPEZ, J. (1996), and MARSHALL, C. and Siegel, M. (1996), stochastic risk assessment models developed by BERKOWITZ, J. (1999) are presented as a process applicable to any situation where an outcome that can be desired is obtained or unexpected and in turn impact is significant or in the organization, Left (2005).

Risk management ensures that economic resources were properly allocated to the relevant functions favoring maximizing the value of equity partners, including third parties. ("Financial Risk Management, 2006). Some benefits to the organization are related to the achievement of goals and objectives, hence decision making is an important element to observe, within the risk management in the company.

### ***Methodology***

The focus of a case study is to describe or measure two or more features or units of analysis in order to determine how or how the phenomenon manifests.

In this sense, this study is aimed to observe and characterize a reality of some SMEs in Pereira, where the financial statements of certain enterprises in a specific year, analyzed and then proceed to perform the calculations and analysis of financial indicators of liquidity, debt and portfolio turnover and the description of their behavior in the risk in each.

Initially liquidity ratios, debt and portfolio management based on the stories series of financial statements of SMEs randomly selected within the sample is calculated.

To calculate the index liquidity ratio or current ratio that tries to verify the availability of the company in the short term, to meet their commitments, also short-term use. The formula is

***Current Ratio = Current Assets / Current Liabilities***

The debt index or debt level was used: This indicator provides the percentage of participation of creditors within the company. Its formula is:

***Debt level with Third = Total Liabilities / Total Assets***

Index Portfolio Turnover shows us that sometimes the accounts receivable portfolio or are converted into cash or recovering during the period was used for recovery of loans, this period could be a month or year:

***Portfolio Rotation = Credit sales / Average CXC***

He worked within SMEs in the database the Super Quartermaster Company of Colombia, excluding those that are in liquidation where companies were classified by subsector, which according to the companies studied were: Construction Residential Construction, Civil Construction works, Construction Works Adaptation, Trade Vehicles and Related Activities, Trade Fuels and Lubricants and Wholesale.

Subsequently, the results of the companies under study each financial indicator was calculated, plus descriptive statistics was applied in order to get simplified information to analyze and interpret it more comfortably and quickly, and could be effectively used for the purpose of this work. Specifically, measures of central tendency were used, which served as reference points to interpret and corroborate the results obtained through the indicators.

After calculating each index (liquidity, leverage and portfolio turnover), this result will be converted in terms of risk as a dichotomous variable as follows:

- 1 - If the index has financial risk
- 0 - if the index has no financial risk

A variable "dummy" or dichotomous is a numerical variable used in regression analysis to represent subgroups of the sample in their study. In the research design, a variable "dummy" is often used to distinguish different groups of variables. In the simplest case, with values 0 and 1 the "dummy" variables are useful because they allow you to use a single regression equation to represent multiple groups.

Finally, after the results of each of the indicators, conditional yes formula was applied to determine whether or not the company had risk, according to the three indicators calculated. The formula was whether the sum of the 3 indicators was equal to or greater than 2, then the company had risk analysis as described above, was to determine the risk to indicator. That is, the analysis in this part of the work was done holistically.

Above a defined risk chart is generated, to determine by company and industry financial risk through the following criteria:

- The company that owns 2 or 3 indicators at Risk (1), own financial risk.
- The company that owns 2 or 3 indicators under conditions of no risk (0), has no financial risk.

After calculating the financial risk for businesses, proceed to make a descriptive analysis of risk behavior by company type (small or medium), for productive sectors as clusters by cluster analysis.

This model will be applied to each company and these results in classes with one table is built with classes, levels or risk scale intervals and the number of variables being odd number (3).

Finally, the data were used to calculate the risk based on liquidity ratios, leverage and loan recovery using the explained variable dichotomous type or dummy and prospectively will proceed to validate this risk model using a logit model, the is a so-called LPM (Logit and Probit models).

## Results and Analysis

After debugging the financial statements of the 2011 series supplied by the Colombian Superintendency of Companies, calculate dummies "Risk" and "No Risk" for each indicator (liquidity, leverage and portfolio management), and to determine the risk by company and industry, we proceeded to run the logit model with the help of SPSS software for the above calculations were based on the averages previously performed on the pilot at 50 and the references were set as follows:

We present below the analysis of the results of logistic regression, a statistical technique which aims to express the probability of an event as a function of certain variables, which are considered potentially influential happen. Logistic regression, like other multivariate statistical techniques, gives the possibility to evaluate the influence of each of the independent variables on the response variable and controlling for the rest. The analytically in order that the probability of interest is related to the explanatory variables is as follows.

$$p = \frac{1}{1 + e^{-(\beta_0 + \beta_1 x_1 + \beta_2 x_2 + \dots + \beta_k x_k)}}$$

This expression is known as a logistic function; where "e" denotes the exponential function and  $b_0, b_1, b_2 \dots b_k$  are the model parameters. By producing the exponential values greater than 0 for any argument, p takes only values between 0 and 1.

If the betas are positive (greater than 0), then the function is increasing and decreasing in the opposite case. A positive coefficient indicates that when p grows so does the variable.

For the interpretation of beta coefficients, it is necessary to refer to the concept of relative risk. The relative risk of an event is defined as the ratio of the probability of that event occurring (p) and the probability of not occurring (1-p). The bi exponential called relative risk, that is, it is a measure of the influence of the variable  $x_i$  on the risk of event occurs, assuming that the rest of the model variables remain constant. A confidence interval for the exponential of b containing 1 indicates that the variable has a significant influence on the occurrence of the event and, conversely, further away from this indicate a greater influence of the variable values.

Once the estimated values of the parameters or coefficients b, we can determine the probability of the event for different values of  $X_i$ .

To run the model to the data of the third series the results of some indices as in the previous series are also softened.

The debt ratio, indices or outliers well above the maximum debt ratios (100%), considering that in reality a company spends on capital adequacy comes to be operated by entities were replaced or state law should enter into liquidation or concordat.

For portfolio management index all high outliers or extreme values were removed and replaced by 360 days, and these days the maximum rotation is greater because all this occurs as portfolio collection difficult and punishable as lost in the income statement for the next period.

The model was run for the time series in 2011, trying to give robustness to model, analysis and also to see the consistency of the model. The result of logistic regression is shown. The dependent variable (risk), which is dichotomous (0 when there is no risk and the value 1 when there is a risk) and one or more independent variables, in our case (liquidity, leverage and portfolio).

When analyzing the results for the risk variable, we can see that all the coefficients are positive, indicating a direct relationship with the irrigation except liquidity which shows an inverse relationship with a negative coefficient. As shown in the table 1, all the coefficients are statistically significant at 0.05 except borrowing 0.1 is significant. The table above also includes five ways to assess the goodness of fit of the model: Omnibus Test -2 log likelihood, Cox and Snell R2, Nagelkerke R2. The Omnibus model coefficients or Chi-square test is highly significant, reflecting a good fit of the model to the data, in addition, a high percentage of observations correctly classified (80.6%) is observed.

As shown in Table No. 2, the model shows that allows companies to better predict risk (91% of cases) and the time series of 2011, correctly classified 86.8 cases, this result shows the consistency of the model and is good considering that most studies and models for risk assessment and prediction have been developed using the variance (VAR) and market prices, this gives greater prominence to results of the proposed if we consider that is being developed under stochastic model or probabilistic models.

The results can also be seen as the significance of the model and the variables of the equation is less than 0.05 so we reject H<sub>0</sub> (SMEs of Pereira presenting financial risk are less than 50%).

Analysis of the R-squared Cox and Snell shows that 49% of the variation in the dependent variable (risk) is explained by the independent variables included in the model (liquidity, leverage and portfolio management), the above result is important because it is giving confidence to the variables chosen as predictors for the risk assessment model.

In analyzing the results of the time series of 2011 to the risk variable, we can see that all the coefficients are positive, indicating a direct relationship with the irrigation except liquidity which shows an inverse relationship with a negative coefficient. As shown in the table, all the coefficients are statistically significant at 0.05.

Consistent with the results described above, the probabilistic models and logit Bazzani (2008) model was developed based on case study on risk analysis in investment projects suggests that stochastic models such as Monte Carlo simulation, random models and probabilistic are more accurate than the deterministic models because the latter ignore the element of risk in an investment, but also clarifies that financial models, do not make decisions for themselves, but suggest greater coverage to infer the future in the short long term, this case study was developed based on a median company in the processed food sector is headquartered Pereira, but also has outlets and markets in the cities of Manizales and Armenia. This bears some similarity to that shown by Villegas (2009) case study on the financial risk analysis projects COMPUGROUP a small company dedicated to solutions where traditional deterministic methods are also used, but supplemented for analysis risk with stochastic analyzes, assigning to it probability distributions for the critical variables and program using the Crystal ball.

Similarly, the descriptive analysis of the situation of SMEs in Pereira was performed, in addition to financial measures calculated trend measures which served as reference points to interpret and corroborate the results obtained from the indicators were applied.

The information was classified in Subsector companies, this classification corresponds to the classification of the Banco de la Republica (Central Bank) and the Superintendency of Companies, which according to the companies studied were 41 sectors.

The figures presented in this document were taken directly into thousands of dollars of information sent by each of the companies under study, grouped as indicated above.

On the 2011 series where 387 companies surveyed, 80% had financial risk was also observed as the consistency of the data shown in the logit models were continued in the probabilistic risk analysis annually.

This trend in the results of the three time series also is reminiscent of studies such as the Economic Commission for Latin America (CEPAL 2013) state as SMEs in emerging economies such as Colombia are constantly facing the financial risk of different areas during operation, but using a tool to identify and assess the risk, companies and sectors could take preventive and corrective risk management to help them remain and financial viability.

In 2011 it was reported that in Pereira 8 out of 10 companies analyzed presented financial risk, the sample to make this chart is 387 companies. 79% of the companies in Risaralda in 2012 presented financial risk, only 21% were free of financial risk, ie, about 1 in 5 companies had no financial risk.

When analyzing the financial risk of Risaralda in 2011 and 2012 we see that it did not suffer major changes, only 1% increase in the number of companies without financial risk, we also increased the sample in 14 companies though we see the impact of this increase was not major, but almost imperceptible.



## **Risk Indicators**

### **Risk of Indebtedness**

The Risk indicator of Indebtedness of the city of Pereira in 2011, was 78% for 387 companies studied. In the graphics of the city of Pereira in 2012, the risk of indebtedness shown was 74% for 401 companies studied, that's an increase of 14 companies in 2011.

This external leverage is not all bad when you consider that studies such as Sharpe (1962) and Markowitz (1959) have shown that it is more expensive (Kc) internally funded or owners with external resources, and when you consider that the company in the three years did not exceed the maximum leverage allowed by financial institutions to Colombia without exempting that are at risk of indebtedness.

### **Liquidity Risk**

In 2011 in the city of Pereira, it was shown that 64% of companies had liquidity risk, compared to 36% of the companies that have no liquidity risk.

In the city of Pereira, in 2012, the indicator of Liquidity Risk remained exactly at the same percentage shown in 2011, but we notice that for 2012 there was an increase in the number of firms in the sampling.

Furthermore, it was observed as SME liquidity is an inverse relationship to the risk, which is valid to run the data in the logit model as mentioned in previous analyzes, but also very similar evidence found in studies such as Fu and Liu (2012), which analyzed the financial risk factors of 216 small and medium Chinese enterprises (SMEs), based on the financial statements of 2010, where they measured the risk model Alexander Bathory and found a relationship significantly and negatively with the ratio, net profit margin, the ratio of net assets and the rotation of the fixed assets. While on the other side of the inventory rotation, rotation portfolio and debt structure not found a significant, quite contrary to what was evident in the present study correlation.

### **Portfolio Management Risk**

In 2011, in the city of Pereira, it was found that 82% of the companies had portfolio management risks.

In 2012, 81% of the companies studied, generated risks in portfolio management.

It can be shown that in the city of Pereira, great changes in portfolio risk management among the companies studied were not obtained because during 2011, 81% of companies surveyed generated risk, and in 2012, 82%, having a larger sample in 2012 with 401 companies studied.

Keep in mind that in many cases the problem is not holding debtors but the companies themselves, which do not make the proper management of such accounts receivable, independent of the use of financial figures such as Factory or sale of portfolio this management in turn affect the liquidity and working capital available for the operation of enterprises.

It can be seen as the time series of companies under study, presented financial risk based on the three indicators described above, which may show a close relationship between liquidity and leverage, as mentioned by authors such as Stiglitz (2012) in XXVII Economy Circle Sitges on the European financial crisis, while further back also mentioned by Sharpe (1964) for his contributions to the theory of portfolio Markowitz (1952) model CAMP at risk as defined by the non-systemic risks.

Likewise also seen as a potential link between liquidity and leverage, not only because both indicators show most of the companies at risk, but also because the current ratio in its calculation includes accounts receivable, which would affect the directly if the loan recovery is slow, because they reduce the cash flows available by organizations.

### **Financial Risk by Sectors in the City Pereira 2011-2012**

Regarding the results of the risk assessment in some key sectors of the city of Pereira, we can say:

In the field of investment and financial services it can be seen that in 2011 75% of the companies had no financial risk and in 2012 this figure changed to 75% of the companies had financial risk. Likewise, in real estate it was observed that in 2011 84% of the companies in the real estate sector showed financial risk and in 2012 these companies were reduced to 57%.

Meanwhile the construction sector can be seen as presenting a financial risk of 74% by 2011 and 71% by 2012, very similar behavior and figures shown by the subsector of construction of civil works, which shows a decline in the financial risk of 4% of the companies in the fitness construction industry in 2012.

In the commercial sector it was observed that there was a trend of risk in two years, the companies that had financial risk for 2011 accounted 87% of the wholesale trade industry.

The vehicle sector presented one of the highest results in terms of risk, it can be shown that in 2011 the companies in the sector of vehicle trade accounted 89% of financial risk and this percentage continued to grow in 2012 with 91% in the market.

In the field of machinery and equipment the lowest risk figures for the two years were shown, there is no change in the 5 companies that are in the manufacturing industry of machinery and equipment. 60% of these companies submitted financial risk for two years.

The textile sector is one of the most important economic activities in the region, it presented figures of a financial risk of 60% for 2011 and 73% for 2012.

This showed a tendency to national figures, especially as shown by Clavijo (2007) ANIF National Association of Financial Institutions in the study presented by the center for economic study ANIF where the highest concentration of MSME in Colombia is in the marketing sector with 69%, but the figure is closer to shed much by the economic census conducted by DANE (2005) where SMEs engaged in the trade sector are 21.5%, this shows once more as the tertiary sector called growing has increased participation in the productive sectors of the country and this behavior is in the direction of global trends.

### ***Findings***

The study showed how in the series of 2011 80% of the surveyed companies had financial risk based on the proposed use of a total of 387 company's analyzed model.

In the sectorial analysis of the 41 sectors classified by the central bank, the marketing sector was the sector under the proposed model presented higher risk, although it should be noted that in Colombia the sector is the largest share of total state enterprises according to previous studies. Given subsets was observed as wholesaling and retailing of vehicles is that present greater risk percentage.

Indicators for individual analysis of time series of 2011, companies had 78% debt, liquidity and 64% in the same pattern of results was found portfolio risk, whereas the other indicators was 82%.

The goodness of fit of the model is highly significant using the Omnibus test of model coefficients or Chi-square, which reflects a good model fit to the data, in addition, a high percentage of correctly classified observations (observed 80.6 %) and better forecasting companies at risk in 91% of cases and correctly classifying 86.8 cases.

Additionally logit model results showed as the significance of the model and the variables of the equation is less than 0.05 which could reject the null hypothesis (H0: SMEs in Pereira presenting financial risk are less 50%, also the omnibus test also showed the significance and could reject the null hypothesis.

It is recommended to run the proposed model when the superintendency of companies Colombia issued data for time series between 2013 and 2014.

Similarly it is recommended to extend the study to firms from other regions or cities and to give more consistent results and validate the benefits of the model, also share the results with guilds and business for more empirical application and verify the usefulness of the model.

This model for assessing the financial risk SMEs can become a useful tool for management, not just unlisted capital market companies, but for those that are listed, as traditional models to determine the risk are based on changes and price volatility in the market in which determinants that are involved in the vast majority are not control of the company, while the model proposed in this study assesses the operational risk management elements of the company.

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**Table No. 1: Variable(s) Introducida(s) en el paso 1: Liquidez, Endeudamiento, Cartera**

Chi-cuadrado	42,66**
-2 log de la verosimilitud	87,990
R cuadrado de Cox y Snell	,339
R cuadrado de Nagelkerke	,472
% 82lasificación correcto	80,60%

\*\*p<0,001

**Table No.2: Classification (a) Predicted Risk**

	Observado	Pronosticado		Porcentaje correcto
		RIESGO		
		,00	1,00	
Paso 1	RIESGO	,00	1,00	78,3
		83	23	91,0
	Porcentaje global	19	192	86,8

a El valor de corte es ,500

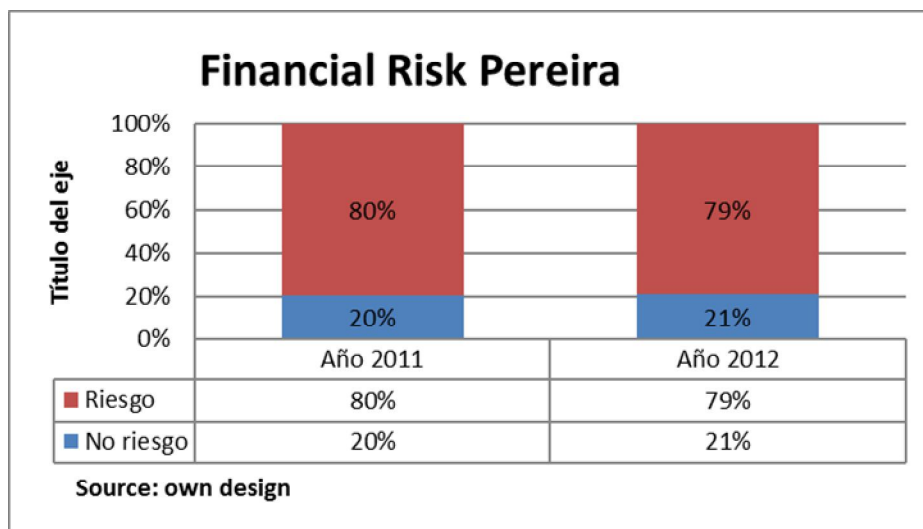
**Table No.3: Variables that are not in Equation**

			Puntuación	gl	Sig.
Paso 0	Variables	LIQUIDEZ	6,483	1	,011
		ENDEUDAM	139,705	1	,000
		CARTERA	57,605	1	,000
	Estadísticos globales		163,007	3	,000

**Table No. 4: Omnibus Tests of Model Coefficients**

		Chi-cuadrado	gl	Sig.
Paso 1	Paso	217,406	3	,000
	Bloque	217,406	3	,000
	Modelo	217,406	3	,000

**Figure No. 1: Financial Risk**



**Figure No. 2: Risk by Industry**

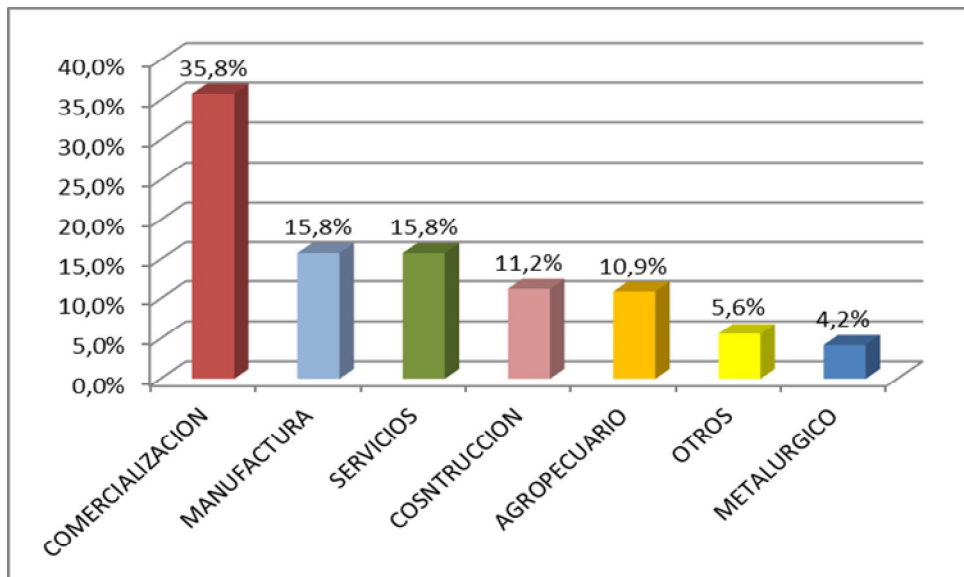


Figure No. 3: Debt Risk

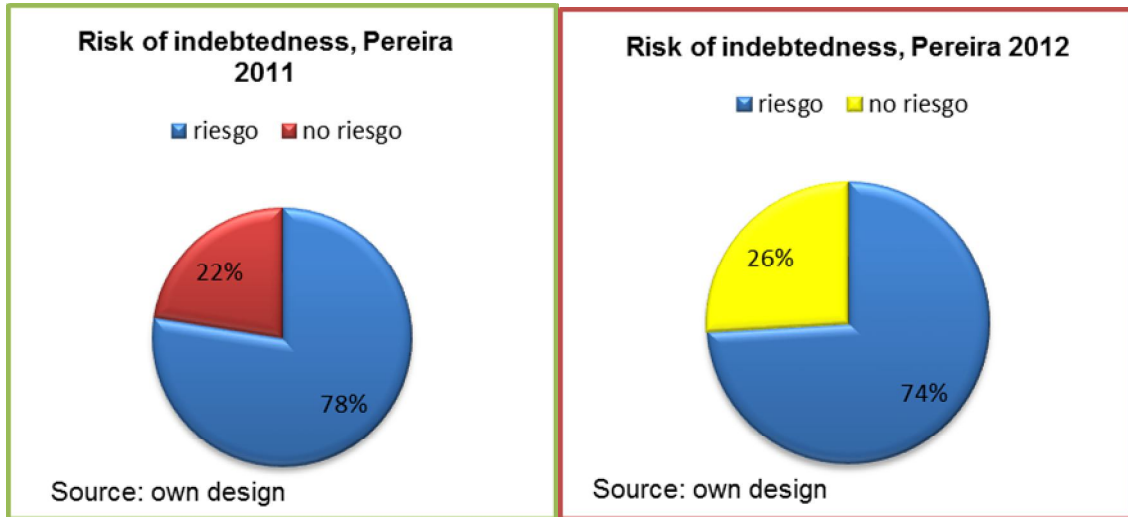


Figure No. 4: Liquidity Risk

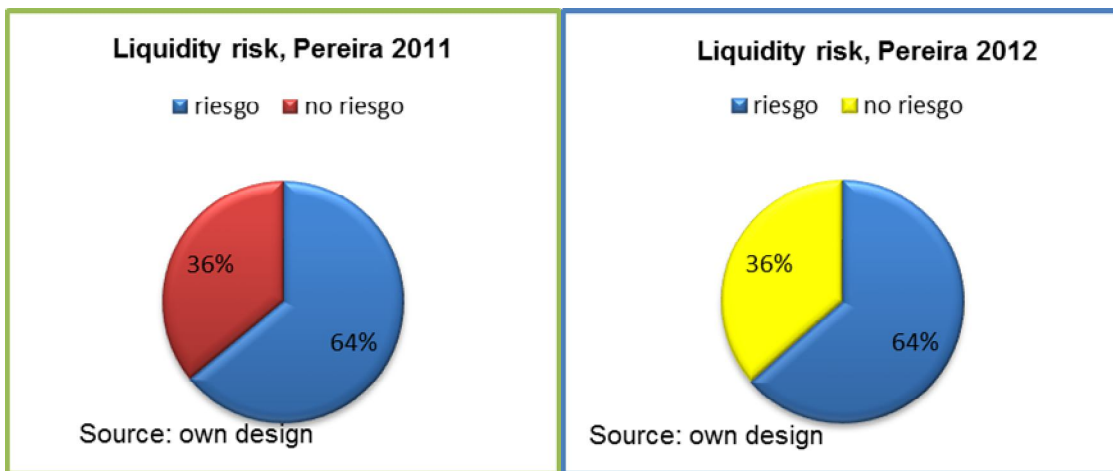


Figure No. 5: Recovery of Portfolio Risk

