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The Impact of Financial Development, Financial Constraints and Capital Controls on Stock Returns

O Impacto do Desenvolvimento Financeiro, Restrições Financeiras e Controles de Capital sobre os Retornos de Ações

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AUTORIZO A REPRODUÇÃO TOTAL OU PARCIAL DESTE TRABALHO, POR QUALQUER MEIO CONVENCIONAL OU ELETRÔNICO, PARA FINS DE ESTUDO E PESQUISA, DESDE QUE CITADA A FONTE.

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“It’s chaos, be kind.”

-Michelle McNamara

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ABSTRACT

GUZMAN, Maria Gabriela Serrano. **The Impact of Financial Development, Financial Constraints and Capital Controls on Stock Returns**. 2017. Dissertation (Master's) – Escola de Engenharia de São Carlos. Universidade de São Paulo, São Carlos, 2017.

The aim of this work is to examine the impact of financial development, financial constraints and capital control on stocks market returns. The research looks into stock returns of emerging and developed economies over the period of 2004-2016 by using data, both by firm-level and country level, from 88 developed and emerging countries. Furthermore, the KZ, WW and SA indexes were used to classified as being financially constrained and financially unconstrained and the level of capital control of each group of countries is interacted with financial constraints. We aim to determine the relationship between the variables used as the measurement (depth, access, efficiency and stability) of financial development of a country, the financial constraint and capital control and their relationship to the stock market returns. Previous research focusing on stock market returns have dealt with different influences affecting the stock returns; however, the literature examining the influence of capital control on stock return is scarce. Our results suggest that the extended Fama and French three-factor model including macroeconomic and financial development variables and considering the presence of financial constraints help in the understanding in their impact on asset pricing for emerging and developed countries alike.

Keywords: Capital Control, Financial Development, Stock Returns, Emerging and Developing economies.

RESUMO

GUZMAN, Maria Gabriela.Serrano **O impacto do desenvolvimento financeiro, restrições financeiras e controles de capital sobre os retornos de ações**. 2017. Dissertação (Mestrado) – Escola de Engenharia de São Carlos. Universidade de São Paulo, São Carlos, 2017.

Este trabalho tem por objetivo examinar o impacto do desenvolvimento financeiro, das restrições financeiras e do controle de capital no retorno das ações. A pesquisa analisa o retorno das ações dos países emergentes e desenvolvidos durante o período de 2004-2016 através de uma base de dados de 88 países, emergentes e desenvolvidos, com dados tanto ao nível da firma como ao nível do país. Além disso, os índices KZ, WW e SA são usados para classificar as empresas como restritas e não restritas financeiramente, e utiliza-se também as interações do nível de controle de capital com as restrições financeiras. O objetivo é determinar a relação entre as variáveis de desenvolvimento financeiro do país (profundidade, acesso, eficiência e estabilidade), as restrições financeiras e o controle de capital com o retorno de mercado das ações. As pesquisas anteriores acerca do tema retorno lidaram com diferentes fatores que afetam o retorno de ações; entretanto, estudos envolvendo a influência do controle de capital no retorno de ações ainda são escassos Nossos resultados sugerem que um modelo composto coletivamente pelo modelo de três fatores de Fama e French e variáveis macroeconômicas e de desenvolvimento financeiro, considerando ao mesmo tempo restrições financeiras, ajuda na melhor compreensão do impacto de ditas variáveis no preço de ativos em países emergentes e desenvolvidos.

Palavras-chave: controles de capital, desenvolvimento financeiro, retornos de ações, Países emergentes e desenvolvidos.

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1. Introduction

The idea behind the asset pricing theory deals with determining and explaining the prices of financial assets in a world of uncertainty. The pricing of the financial assets is a crucial part of the allocation of financial resources, and in an event that mispricing occurs, it could potentially lead an inefficiency in investment and consumption in the real economy. (Qian, 2017)

When dealing with finance and the asset pricing theory, one of the principal issues is that of understanding why on average, financial assets earn extremely different returns. The classical capital asset pricing models, or CAPM introduced by Sharpe (1964) and Lintner (1965) presents a situation in which the opportunities of investment are constant and, in order to increase the chances to maximize their expected returns, the investors hold efficient portfolios. More specifically, this model anticipates that the risk premium will be proportional to its beta (Perold, 2004).

In an attempt to extend the CAPM model, and to consider other factors which could explain stock returns, Fama and French introduced the "three-factor model". This model extended the CAPM model by adding proxies which could be viewed as more fundamental economic variables, in particular size and book-to-market ratio. While the influence of the risk on stock returns is a topic that has been widely studied, we venture into trying to see the influence that financial development, financial constraint and capital control may exert in stock returns.

There is abundant literature investigating the relationship between financial development and economic growth (King and Levine, 1993; Bekaert and Harvey, 1995, 1997; Rajan and Zingales, 1998; Beck, Levine and Loayza, 2000). In the investigatory attempt to analyze the relationship between financial development and economic growth, multiple other topics were also studied. These topics varied from investigating causality (Rajan and Zingales, 1998; Abu-Bader and Abu-Qarn, 2008) to the possibility that the differences between the levels of financial development between countries were due to legal and accounting systems (Levine, Loayza and Beck, 2000).

The topic of stock returns has also been extensively studied and a wide variety of asset pricing models have been proposed in the literature (Sharpe, 1964; Litner 1965; Merton 1973; Fama and French, 1992, 1993, 1996, 2004; Banz, 1981; Lakonishok, Shleifer and Vishny, 1994; Kothari, Shanken and Sloan, 1995; Carhart, 1997). The interesting aspect of the theory of finance is that riskier assets offer predictions of higher expected returns as way to reward the investors for assuming a higher risk. While these studies care about relationship between risks

and returns for the investors, we consider other aspects such as microeconomic factors which deal with firm level data, macroeconomic factors, which is concerned with country level data, financial development factors and information regarding the capital control of each country. The studies addressing the relationship between financial development and stock returns are still limited (Dellas and Hess 2005; Abugri 2006).

The concept of financial development could be explained as the ability of the financial instruments to facilitate economic transactions (Levine 2005). Keeping this in mind, this topic gains importance, especially for emerging markets, due to the fact that it could help researchers understand financial constraints in both the credit and capital market.

The idea behind the label "emerging markets" is the fact that these countries emerge from their status of being less-developed to join the group of developed countries. Historically, an issue behind the researching of emerging economies is the lack of data for these economies. However, there have been many advances and renew interest in the topic of emerging economies since the 1990s. Bekaert and Harvey (2002) work looks at the "big picture" when dealing with the topic of emerging economies. The authors provide an overview of how the research of regarding this topic has evolved, fields in which this evolution has taken place and future steps.

The financial development variables used in this study are complementary of each other. For example: Let's say there is a country in which a bank's loan standards have relaxed, banks give loans without strict rules, and banks do not have correct risk or loan management. At first glance, an observer may see a rapid growth within the country, which could be interpreted, as a sign of deepening and raise in access to finance. Also, it may seem that the financial sector is efficient due to having no approval process and that allows the banks to lower their cost. The first impression would be that the financial sector was working well, until the loans turn bad. Once the loans turn bad, the reality of the situation would sink in. The system would be very unstable and the possibility of creating a crisis would be an almost certain one.

Another influence that we take into consideration is that of capital control. Capital control is a topic that is essential when dealing with international macroeconomics. In the same way that capital control may be responsible for a variety of benefits, it may also leave the market vulnerable to global shocks. In 2008, the global crisis highlighted that not all decisions regarding borrowing and lending of capital are rational and that inhibited flows could potentially result in an exorbitant level of volatility. In this study, we attempt to see the impact of capital controls in stock returns in both, emerging and developed countries.

We investigate the relationship between financial development, financial constraints, capital control and stock return. We do so by observing how different measurements of financial development, the most commonly used indexes of financial constraints and high and low levels of capital control affect the stock returns of firms. Following the train of thought of Dellas and Hess (2005) and Abugri (2008), we use four measures of financial development (depth, access, efficiency and stability). Furthermore, we classify the sample by developed and emerging countries and then apply the three different indexes of financial constraints to each group to determine the impact of financial constraints on stock returns. Lastly, the effect of capital control on stock returns is also analyzed.

The main contribution of this paper is that we consider the effects of capital control for financially constrained firms on stock returns. By classifying the countries as having high or low capital control, we also contribute to the understanding of the features and differences of each group on stock market return. This distinction allows us to investigate the relationship between capital control and financial constraints factors on stock returns for emerging and developed economies.

Another contribution of this paper is that we consider the effects of financial development factors and domestic macroeconomic shocks on stock returns. By classifying the countries as developed and emerging, we also contribute to the understanding the features and differences of each group on stock market return. These distinctions allow us to investigate the relationship between macroeconomic and financial development factors, as well their effect on a firm's stock returns, and how the effects differ for developed and emerging economies. The relationship between financial constraints and stock returns and how the interaction between GDP growth and financial constraints, as well as the interaction between capital control and financial constraints affect stock returns are also investigated.

The analysis of the relationship between financial constraints and stock returns contributes to the literature by considering how the presence of financial constraint impacts the decision to invest in the stock market. In the presence of financial constraint there are frictions that should be considered for investment decisions on stock market. The impact of the reductions of credit conditions will be higher for financially constrained firms making it more difficult to invest which can compromise their expected future cash flow and in turn the stock returns.

We employ an unbalanced panel data of 88 countries with 14,728 firms segregated into developed and emerging groups, for the period of 2004 to 2016. We investigate the effect that financial development has on stock returns as well as how financial constraints and capital

control impact stock returns. Furthermore, we also analyze the interaction between financial constraint and GDP growth and financial constraint and capital control. In order to be able to observe these relationships, financial development indicators, including country and firm-level variables, are used. The sample is also divided into three groups according to three financial constraint indexes in order to analyze how the effects differ in the stock returns whether the firm is financially constrained or not. Additionally, the sample is classified as the emerging countries having high capital control while the developed countries have low capital control. This classification is made in order to differentiate the role of that capital control may have over stock returns. Our results suggest the impact of the Fama and French three-factor model including the macroeconomic and financial development variables while considering the presence of financial constraint are different based on whether you are looking at emerging or developed countries. Nevertheless, the different effects represent important aspects that should be taken into consideration by policy makers.

The paper is organized in 5 sections, including this introduction. Section 2 presents a brief literature review regarding previous studies in the topic of asset pricing, macroeconomic activity, financial development, financial constraints and capital control. Section 3 describes the data and methodology. In section 4, we present our results and lastly, the conclusions are presented.

1. LITERATURE REVIEW

2.1 Asset Pricing

Calomiris, Love and Pería (2012) define stock returns as being a "unique measure of performance that is comparable across countries, forward-looking, comprehensive in scope and insensitive to differences in accounting rules".

The Capital Asset Pricing Model or CAPM, introduced by Sharpe (1964) and Lintner (1965) builds upon previous work from Harry Markowitz (1952) referencing modern portfolio theory and diversification. This asset pricing model is used to make predictions in reference on how risk is measured in addition to investigating the relationship between expected return and risk. In order to implement the CAPM model, there are four assumptions that must be made: 1) investors are risk averse; 2) the markets are perfect – there are no transaction cost, information is costless and readily available and borrowing and lending between investors is possible at a risk-free rate; 3) all investors have access to the same opportunities; and 4) the estimates used by the by investors regarding the asset expected returns, standard deviation of returns and the correlations among asset returns are the same (Perold, 2004).

The CAPM model is usually expressed in the following equation:

$$E(R) - R_f = \beta\ (E(R_m) - R_f \tag{1}$$

where $E(R)$ is the expected return of an asset given its beta, R_f is the risk-free rate, R_m is the return of the market portfolio and β measures the sensitivity of an assets to the movement in the stock market. More specifically, on the left side of equation 1, the risk premium of an asset is shown. The right hand side of the equation shows the risk premium of the market portfolio. When looking at the theory, the beta of the market portfolio is defined as 1. It is based on this observation that can be stated that a beta that is greater than 1 suggests that an asset has a higher risk than that of the overall market, while a beta smaller than 1 suggest that the risk of the asset is less than that of the overall market. The idea that a higher risk should be compensated by higher returns is based on classical finance theory. The theory also highlights the statement that a beta of higher value should result in a higher return in the CAPM model.

Fama and French (1993) extend the CAPM model so that not only takes into consideration one factor (the market portfolio) in order to attempt to explain stock returns, but

also considers an additional two risk factors to the model. The extension of the CAPM model by Fama and French is rightfully called the Fama-French three-factor model.
The expression for the Fama–French three-factor model is:

$$R_i - R_f = \alpha + \beta_m \left(R_{mi} - R_f\right) + \beta_{smb} SMB_i + \beta_{hml} HML_i + \varepsilon \qquad (2)$$

where R_m remains as the return of the market portfolio; the extension lies in SMB (which stands for "Small Minus Big") and HML (which stands for "High Minus Low"). The purpose of this extension is to incorporate *Size* (measured by market capitalization) and *book-to-market ratio* to the ongoing investigation of stock returns. More specifically, SMB is considered as the difference in returns between the smallest largest market capitalization stock, whereas are HML is the difference in return between high and low book-to-market in the corresponding firms.

In taking their cues from historical observations, Fama and French (1993) imply that big capitalization stock are usually outperformed by small capitalization stock (size premium). Additionally, stocks with high book-to-market ratio (value stocks) generally outperform low book-to-market ratio (growth). By including the size and price ratio, Fama- and-French three model factor assumes that the market risk factor does not captured the risk caused by the size and the value/growth ratio (book to market ratio).

The effects of value and momentum on emerging stock returns are investigated by Cakici, Fabozzi and Tan (2013). Their work investigates the size patterns in value and the momentum in the equity market of 18 emerging countries and the integration process [1] of emerging economies with that of the U.S equity markets. In order to explain stock returns, the authors use three specific models: the capital asset pricing model (CAPM) (Linter, 1965; Sharpe, 1964), the Fama-French three-factor model (Fama and French, 1993), and the Carhart four-factor model (1997). The results of this work suggest that the value effect in emerging countries is similar across both, small and big stocks (or stocks with small and large capitalization); however, this finding does not match what has been shown in developed markets. When looking into the momentum effect, it is found to be significantly larger for small stock, which matches the findings in developed markets. Furthermore, evidence indicates that the relationship of returns with value and momentum for emerging markets seem to be negatively correlated. This finding is constant with that of developed markets, Finally, when

[1] The authors study the integration of emerging markets with that of the U.S equity market by investigating the local cross-sections of value and momentum of stock return by using and comparing both U.S and local factors in order to examine it.

dealing with the asset pricing test that investigate value and momentum measure, it is shown that local factors are notably better than U.S factors.

While the CAPM model takes into consideration risk when determining stock returns, and the Fama-French three-factor model incorporates size and growth, there are still several factors not included such as those referencing macroeconomic factors.

2.2 Macroeconomic Activity

Amihud and Mendelson (1986) and Jacoby, Fowler and Gottesman (2000), while looking at investment and stock returns, suggest a link between corporate cost of capital and liquidity. The investigation in these studies shows how liquidity, marketability or trading costs are factors that influence the portfolio decisions of investors. Due to the fact that rational investors need a higher risk premium in order to hold illiquid securities, cross-sectional risk-adjusted returns are lower for liquid stock. This has been investigated in various empirical studies run on mature capital markets. Kiyotaki and Moore (1997) study how small temporary shocks to technology or income distribution in an economy, in which the credit limits are endogenously determined, might generate large, persistent fluctuations in output and asset prices. In other words, how credit constraints may amplify the effect of various shocks. It must be addressed that there is an importance for both, bank and stock market liquidity.

In his work, Rouwenhorst (1999) investigates the differences and similarities between the return factors of developed and emerging markets, and the relationship between liquidity and stock return in emerging economies. Through the examination of the cross section of returns of 1705 firms from 20 emerging markets collected from the Emerging Market Database (EMBD) of the International Finance Corporation (IFC), the authors state that the return factors in emerging markets are similar to those in developed markets. The results show that the stock from emerging markets exhibit momentum[2], value stocks surpassed growth stocks and small stock exceed large stocks. This works shows no evidence that the local market betas are associated with average returns. Due to the fact that there is little evidence that the correlations between the local factor portfolio increased, the authors infer that the factors accountable for the increase of the countries belonging to emerging markets correlations are different to those that are responsible for the differences between expected return within these markets. Furthermore, the results of the Bayesian analysis of the return premium of both, developed and

[2] Momentum is used by Rouwenhorst (1999) as the relative strength portfolios.

emerging countries, agree with the hypothesis that size, momentum and value strategies are compensated for in expected returns around the world. In regards to the relationship between expected returns and the share turnover, the results do not provide evidence proving a relationship for emerging countries. Nevertheless, there is a positive correlation between turnover and beta, size, momentum and value in emerging counties which implies that returns premiums do not only reflect a compensation for illiquidity.

Beck, Levine and Loayza's (2000) investigate the relationship between the growth sources - defined as private saving rate, physical capital accumulation, and total factor productivity growth - and financial intermediary development. In order to control for endogenous determination of financial intermediary development with growth and the sources or growth, the authors use two econometric methods: a traditional cross-sectional, instrumental variable estimator[3] and a cross-country, time-series panel of data employing dynamic panel techniques in order to estimates the relation between financial development and growth, capital accumulation, saving rate and productivity growth. The results show that a large, positive impact is applied on the total factor productivity growth by financial intermediaries and it continues on to affect the overall GDP growth; also, they validate the perspective stating that higher functioning financial intermediaries improve the allocation of resources, speeds up the total factor productivity growth with a favorable outcome for long-run economic growth.

Bernanke and Gertler (2000) research the effects of asset price volatility in the management of monetary policy. The authors focus on monetary policy because while they agree that monetary policy alone is not sufficient to contain the possibility of damaging effects of booms and bust in asset prices; however, based on history, they stated that damages from asset price crashes in the economy have been sustained in cases where monetary policy remained unresponsive. In order to investigate this relationship, the authors used non-fundamental movements[4] present in asset prices into a dynamic macroeconomic framework. The results, for large industrial economies such as the United States and Japan, show that flexible inflation targeting impart a unified, effective framework which leads to a macroeconomic and financial stability. Furthermore, the suggestion that small economies should adopt flexible inflation targeting as part of a deal which would come with an improvement of financial regulation and fiscal reform was also made.

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[3] Legal origin of each country is used as an instrument to extract the exogenous component of financial intermediary development in the pure cross-sectional regressions.

[4] The suggested sources of "non-fundamental" fluctuations in asset prices are: poor regulatory practice and imperfect rationality on the part of investors.

As mentioned by Dellas and Hess (2002) if the stock market is thin, then there is a greater possibility that it will demonstrate bigger fluctuations in prices leading to a less amenable to host international capital; however, if the stock market is sufficiently liquid, it will allow the stock traders to minimize price volatility by smoothing their trades. The consequence of a thin market in a particular country is that the co-movement with the rest of the world will be lower.

Abugri's (2006) work investigates whether the interaction in key macroeconomic indicators such as exchange rates, interest rate, industrial production and money supply in four specific Latin American countries significantly explain market returns. The author concludes that because the response of the market returns from shock to macroeconomic variables tends to vary from country to country, they cannot be determined *a priori.* Furthermore, the results also pointed to global variables having significant and consistent effects on the market returns which serve to emphasize the importance of external shocks in Latin American markets.

A report by the International Organization of Security Commissions, (IOSCO, 2007), emerging markets committee concluded that due to the fact that investors are attracted to higher levels of liquidity, it plays an important role in the development of a market and economic growth. Factors that typically lower transactions cost, that facilitate trading and timely settlement and those that ensure that large trades have only a limited impact on market prices are the factors that affect market liquidity. One of the threats to small and less developed markets, due to the process of globalization, is that the domestic market's liquidity may dry up because of the transfer of liquidity to major markets in the region. The authors conclude that regardless of whether the efforts were direct or indirect, several markets have shown that the initiatives have had a positive effect on liquidity while others suggest that it is still a work in progress.

Gay (2008) uses the Box-Jenkins ARIMA model in order to investigates the relationship between stock market index prices and the macroeconomic variables of exchange rate and oil in the countries of Brazil, Russia, India and China from 1999 to 2006. The results show that the effect on the international macroeconomic factors of exchange rate and oil price on stock market index are not significant in any of the emerging countries. Furthermore, based on the results, the author suggests that the emerging countries that were used in this work show a weak form of market efficiency.

Geetha, Mohidin, Chandran and Chong (2011) look into the links between stock market, expected inflation rate, unexpected inflation rate, exchange rate, interest rate and GDP for Malaysia, China and the United States for the period of 2000 to 2009. Based on the Vector

Error-Correction (VEC) model, the results show that there is no short run relationship between stock markets and the macroeconomic variables used in the study for Malaysia and the US; however, the results for the VEC model for China, shows that there is short run relationship between expected inflation rates with the stock market.

Calomiris, Love and Peria (2012) argue that the effect of stock liquidity may have on returns is ambiguous. One possibility is that an increase in liquidity could contribute to a steeper decline in equity prices, due to the fact that investors choose their most liquid risky assets to sell during a liquidity squeeze. On the other hand, in the case of a crisis, liquidity becomes more valuable, which implies that relatively illiquid stocks could experience relative price declines. The observed effects liquidity has on returns are similar. If liquid stock declines during a crisis, it could be said that the relatively illiquid stocks will show similar or even greater decline in value.

2.3 Financial Development

While macroeconomic factors aid in the study of stock returns, an additional factor, which may affect stock returns through its relationship with the stock market is that of financial development. Financial development is understood as the process in which financial systems (financial instruments, markets and intermediaries) ameliorate and/or eventually overcome enforcement and information frictions, in addition to transaction cost, in order to facilitate trade, mobilize savings and diversify risk.

The relationship between financial development and economic growth has been one of the most studied topics in finance and it is often explained as growth being promoted by the financial system. It can either happen through the increase of the volume of saving, in countries in which this is common practice such as the United States or UK, or through foreign direct investments in countries like Brazil in which saving is not practiced or by bettering the efficiency in which the savings are allocated across investment plans (Giovannini, Iacopetta, and Minetti, 2013).

There are a variety of factors that may help determine the financial development. For example, Huang (2010) investigates the political, economic, policy and geographic determinants of the development of financial market and how variables such as institutional, macroeconomic and geographic factors seem to play a role in the determination of the level of development.

Institutional factors have been considerably studied and its research involves the study of the effects of legal and regulatory environment on the functioning of financial markets. Generally, it is possible that institutions may have an intense impact on the supply side of financial development. Overall, the level of institutional development that exists in a country to a degree determines the sophistication of the financial system (Huang, 2010).

The policy view emphasizes the importance of various macroeconomic policies, openness of goods market and financial liberalization in promoting financial development. The effect of the policies on the financial development could be working through either its demand side or its supply side.

The factors addressing the correlation between geography and financial development have been less investigated than those relating to policy and institutions. However, these works have tackled three specific aspects: the first being concerned with the correlation between latitude and economic development Sachs (2003); the second aspect deals with the countries being landlocked (Malik and Temple, 2009); and lastly, the third aspect deals with the link between resource endowment and economic development (Easterly and Levine, 2003).

In order to comprehend how financial systems are a necessary part of financial development, it is necessary to understand their main functions. According to Levine (2005), the primary functions of the financial systems are: (1) the facilitation of trading, hedging, diversifying, and pooling risk; (2) the allocation of resources; (3) the monitoring of investment and implementation of corporate governance; (4) the mobilization and pooling of saving and (5) the facilitation of the exchange of goods and services. Since every one of the financial functions potentially has an influence on saving and investment decisions, it can be stated that it also influences economic growth.

Early theoretical studies show that economists have had different views about the relationship between the financial system and economic growth. While authors like Bagehot (1873), Schumpeter (1912), Gurley and Shaw (1955), Goldsmith (1969) and McKinnon (1973) dismissed the idea that the nexus between financial development and economic growth could be disregarded without limiting the way that economic growth is understood. But authors like Merton Miller (1998) state that the concept that financial development contributes to economic growth is too evident for serious discussion. In addition to the theoretical studies, there have also been countless empirical studies investigating the relationship between financial development and economic growth (Jayaratne and Strahan, 1995; Harris 1997; Levine and Zervos, 1998; Rousseau and Wachtel, 2000).

Levine and Zervo (1998) integrate measures of the functioning of stock markets into King and Levine's (1993)[5] study dealing with financial development and economic growth. The authors investigate if both, banking and stock markets indicators are "robustly correlated with current and future rates of economic growth, capital accumulation, productivity growth, and private savings". The results show that there is a positively and robustly correlated relationship between stock market liquidity, banking development and future and current rate of economic growth, capital accumulation, and productivity growth. In addition, since the two measures, stock market liquidity and banking development both come up as significant in the regressions, it is implied that financial services provided by banks are different from those provided by stock markets. Lastly, the evidence shows a strong and positive relationship between financial development and economic growth suggesting that financial factors are an intrinsic part of the growth process.

An econometrically approach, conducted by Rajan and Zingales (1998), presents factors which assisted in driving the study dealing with causality between financial development and economic growth. By taking into consideration that, in some macroeconomic models, savings has an influence on the long-run growth rate of the economy and by using this as a proxy for the level of financial development. The authors focus on the theoretical mechanisms in which financial market and institutions help a firm overcome adverse selection and moral hazard problems and in doing so, the cost of raising money from outsiders would decrease. They argue that having access to credit gives firms more opportunities for profitable investment. Following the expectations of growth, the stock market takes advantage of the present value of those opportunities.

Demirgüç-Kunt and Levine's (1996) research the link between the stock market and the economic development. They focus on four issues: (1) constructing further criteria of stock market development than any earlier studies had provided; (2) investigating the relationship between financial intermediaries and stock markets by using the new measurement of stock market development; (3) examining the relationship between long-run economic growth and stock market development and (4) investigating previous research that show a relationship between stock market development and financing choices of firms. The authors show that the financial structures are extremely different depending on the country and that as countries develop economically so do their financial structures. Based on the results, it can be stated that

[5] King, Robert G. and Levine, Ross. "Finance and Growth: Schumpeter Might Be Right." *Quarterly Journal of Economics,* August 1993a, *108* (3) pp 717-38

as countries get richer over time or as a poor country increases in wealth, they benefit from: their financial intermediaries becoming larger, non-banks become more important, bank allocate as much credit as the central bank, and the stock markets become larger.

Beck, Lundberg and Majnoni (2003) results suggest that the financial intermediaries have no overall effect in growth volatility. Aghion, Banerjee and Piketty (1999) demonstrates that when there is a lack of equality in the capital markets and individuals do not have an equal access to the investment opportunities then there is a cyclical demand and supply of credit, which shows in a supply of output. Financial development also allows an economy to absorb investment more efficiently. Arestis, Demetriades and Luintel (2001) proposed that the theory of volatility might reflect efficiency in stock market; however, empirical results did not support this theory.

Pagan and Soydemir (2001) point out that economic and political changes, in addition to financial liberalization in Latin American countries, have cause them to be of significance in the Latin American share of U.S and world trade. These changes have led to growth in market capitalization and trading value of their stock. Furthermore, international investors - in an attempt to take advantage of diversification, decreasing measure of concentration, and increasing capitalization- have increase the allocation of funds to the countries. Additionally, Bilson, Brailsford and Hooper (2001) state that given the changes, the expectation of distinguishing features between these “changing” Latin American countries and developed stock markets is reasonable.

Hassan, Sanchez and Yu (2011) use diverse multivariate time-series analysis techniques and unbalanced panel estimations to study direction, timing, and strength of the causal link between financial and real sectors spread through different geographic areas and diverse income group as to explore some policy implications. The results of this work are in agreement with works from King and Levine (1993) and Levine et al. (2000) in that there is a strong linkage between financial development and economic growth. Additionally, it points out that while it is necessary to have financial development in developing countries, it is not enough to secure a constant economic growth.

Dellas and Hess (2005) pool emerging and mature markets and investigate how the moments of stock returns are affected by the financial development of the country based on standard measures of financial development such as size, quality of banking systems and stock market liquidity (which is measured as the ratio of total shares traded as a percentage of GDP). The authors investigate how the distribution of asset returns may depend on how well the financial system carries out specific functions. This can be done directly (through the

monitoring of managers and exertion of corporate control, and the provision of liquidity) or indirectly (through macroeconomic volatility, and production structure and trade patterns).

The indirect relationships that are highlighted explain how financial development affects stock returns are: first, through its effects on the macroeconomic growth and volatility and secondly, through its effect on the structure of production and pattern of international trade; however, the main focus of the study is on the macroeconomic volatility (Dellas and Hess, 2005).

Furthermore, Dellas and Hess (2005) establish that the banking development, and the variance and covariance of the country stock returns are closely related regardless of the currency in which the rate of stock returns are measured. Additionally, their results state that the "deeper" and more efficient banking systems may have been associated to significantly lower stock return volatility and that banking size is less important that "quality".

In summary, Dellas and Hess (2005) state that several markets have shown interests in starting initiatives in order to increase the level of liquidity in their market and by doing so increasing the financial development. Also, while there have been theories showing a negative relationship between financial development and growth volatility, there have also been theories that show that there is no overall effect of growth volatility (Bacchetta and Caminal, 2000; Beck, Lundberg and Majnoni, 2001).

Wurgler (2000), while analyzing data for 65 countries through a period of 33 years, demonstrated that better functioning financial markets, measured by the size of the domestic stock and credit markets relative to GDP, are associated with better allocation of capital. The author states that it is not the higher investment rates that make up the advantage of financially developed countries but that they allocate their resources to more profitable investment projects.

When it comes to firms choosing to fund an investment, the possibility of financial constraints must be taken into consideration. Financial constrains are characterized as friction that prevent the funding of all desired project by the firms which may be due to bad credit conditions, inability to obtain a loan, or inability to issue new stocks. However, regardless of the reason, it is something that must be looked at when dealing with stock returns.

2.4 – Financial Constraints

Recent studies in corporate finance tackle the factors that affect the investment decisions that are made by managers and whether or not they really contribute to the optimization of the company's profit. Under the assumption of a competitive market with perfect information,

Modigliani and Miller (1958) theorize that the financial structure will not affect their decisions and decisions will be made based only on the investment opportunities. Based on that assumption, the way in which the company is financed is not an influential factor to its value, and the value depends solely on the cash flow generated by the company and its risk.

Information asymmetry, which can cause a kind of market failure, deals with the study of the decision-making in a transaction when one side has more or better information than the other, between investor and managers was introduced to corporate finance by the work of Ross (1977). The author argued that in order for better projects to be financed then a transfer of information must take place

Jensen and Meckling (1973) give importance to the topic involving the impact of structure of property on the value of the company by criticizing the way they see firms as black boxes, with their respective inputs and outputs, looking to achieve equilibrium and the maximization of profit but not considering that the individuals present in this process can aim for different goals. Another problem that may arise between the shareholders and creditors is that of agency problems. Jensen and Meckling (1976) believe that shareholders will be encouraged to invest in riskier projects due to the fact that if the problem fails the biggest bulk of the damage will fall upon the credits. However, if it is successful, the majority of the profit will go to the shareholders.

Having considered the presence of asymmetrical information and cost of transactions in the credits and capital markets, and that capital compromises the efficiency of these markets leading to a financial restriction problem, there have been abundant work addressed to looking into how the financial constraints influenced the behavior of corporate investments.

In 1988, Fazzari, Hubbard and Pertersen attempted to control information asymmetry by assuming that, companies in which the information asymmetry is present, would have to pay a premium to rise external financing. When analyzing the data, the authors divided the companies. According to the authors, firms that use internal resources in order to invest, when the access to external capital is limited and the cost are higher than that of their own, is what generates a dependency on the firm's own retained earnings. The authors use traditional investment models such as accelerator, Tobin *q* and neoclassical and examine different groups of companies with varied financial characteristics. The authors included the proxy of cash flow (which represents internal capital) of the firms and used the cash flow and the *q* of Tobin as explicatory variables. It was concluded that the firms that would most likely have the highest difference between the cost of internal and external capital would necessarily be those that show the highest sensibility to the cash flow investment.

Fazzari and Petersen (1993) introduced new ways to test for financial constraints stressing the role of working capital as both a use and a source of funds. Due to a variety of reasons, changes made to the level of fixed investments is very costly for firms, therefore they will look into maintaining a stable fixed-investment path keeping other things equal. The authors also emphasized the difference between the irreversibility of the fixed capital and working capital which is reversible stock that can be used as a source of funds to soften the constraints in the short run.

The study by Devereux and Schiantarelli (1990) present econometric corroboration concerning the influence of the financial factors such as cash flow, debt and stock measures of liquidity on the decisions that British companies make regarding investments and look to see if the impact of the financial factors differs across the various types of firms. The authors looked at 720 companies, and integrated variables of size, age and a dummy variable representing whether the company was functioning in a growing or declining sector, to the model used by Fazzari et al. from 1988. The results show that the impact of cash flow on investment appears to differ in magnitude depending on the firms. The authors concluded that the role played by cash flow was more significant in larger firms than smaller ones. Also, when looking at size, the impact of cash flow appears to be higher for companies in growing sectors. Lastly, when looking at the firms according to age, the cash flow tends to be of more importance for newer firms.

Kaplan and Zingales (1997) and Cleary (1999) have both criticized Fazziri et al. (1988) research. Kaplan and Zingales (1997) investigate the validity of using investment cash-flow sensitivities to get measure of financing constraints by looking at the firms that were identified in Fazzari's et al. work. The issue is not in the sensitivity of an investment to cash flow but that the value of the coefficients grows monotonically when dealing with financial constraints. The model used by Kaplan and Zingales (1997) reworked Fazzari's et al model and did not include a criterion for the classification of financial restriction a priori as their intent was to develop a measure for financial constraints. The results show that in fact, the investment decisions for the firms with the smallest financial constraints are the most sensitive to the cash flow availability.

Carpenter and Guariglia's (2008) research analyzes the correlation between cash flow and investment. In order to evaluate the part that cash flow plays in investment, the authors introduce a new proxy, alongside *Q*, for the "expectations reflecting the firms' insiders' evaluation opportunities". The authors use data over the period of 1983 to 2000 for 693 British firms and classified them by size based on the number of employees. When the variable Tobin's *q* was considered but the proxy was not, the results show that cash flow was significant in large

companies and small companies; nevertheless, the effect was bigger for small companies. When the regressions were run with both the firm's contracted capital expenditure and the *Q*, the explanatory power of cash flow decreased for large firms but it remained the same for small firms. The results propose that, although cash flow could encompass information regarding investment opportunities not contained in *Q*, the significance that comes from the cash flow in an investment equation come from the part it plays in capturing the effect of credit frictions.

While there has been extensive literature attempting deal with the financial constraints and investments, there results have not been definitive. As presented in the literature, there is no singular way to combine the theory regarding financial constraints in investment decisions. However, when looking at decision making regarding investment, it is believed that the sentiments of the investors directly affect stock prices which could potentially and indirectly affect real activity.

Lamont, Polk and Saá-Requejo's (2001) work looks to see if the impact of financial constraints on the value of a firm is something that can be observed in stock returns. While the term financial constraints make the issues such as bankruptcy risks, economic or financial distress come to mind, the authors use the term financial constraints to describe "the frictions that prevent the firm from funding all desired investment". The authors take into consideration of the regression coefficients of Kaplan and Zingales (1997) work in order to build an index which is made up a linear combination of 5 accounting ratios, and it is therefore called the KZ index.

Due to the fact that the KZ index is an in-depth study of firms, it is found attractive by researchers attempting to investigate financial constraints. Lamont et al. (2001) are able to reach three conclusions through their study of whether there is a financial constraint factor in stock returns. The first conclusion that is reached based on the evidence is that financial constraints do affect the value of a firm and degree of the financial constraints varies over time. The second conclusion is that constrained firms earn lower returns than unconstrained firms. Thirdly, the returns for financially constrained firms are not significantly more cyclical than average. It is important to note that there are contradicting views on how the financial constrains should affect valuation and if they should bind more during expansion or downturns. In contrast to Lamont et al. (2001), Perez-Quiros and Timmerman (2000) state that the large firms' returns are less sensitive to credit tightening than small firms' stock returns.

Whited and Wu (2006) constructed an index of the external finance constraints of firms via the GMM (Generalized Method of Moments) estimation of an investment Euler equation. The authors attempt to answer the question of whether the effects of financial constraints are

priced in asset markets. The results of this work suggest that the firms classified as constrained with basis on this index are small, they underinvest, do not have bong ratings and have low analyst coverage. Additionally, through time-series test, it is determined that stock returns on constrained firms positively covary with other constrained firm's stock return. The cross-sectional regression of the returns of firms on the index of financial constraints constructed by Whited and Wu (2006), in addition to a variety of other firm characteristics stipulate that firms that are more constrained earn higher returns. Furthermore, when financial constraints are considered, the usually expected result of smaller firms earning higher returns disappear.

Hadlock and Pierce, in their work from 2010, suggest an additional financial constraint index. The authors, by reading the statements that were made by manager in SEC filing for a sample of randomly selected firms, for a period of 1995 to 2004, categorize firms by their financially constrained status[6]. Due to concerns regarding endogeneity, the authors investigate the role of firm and size resulting in evidence stating that factors are nonlinear in financial constraints. Hadlock and Pierce (2010), using the relation between size and age, suggest a new index called SA index. They state that the new index has an intuitive appeal and the factors are more exogenous than most of the alternatives.

Campello and Chen (2010), through the use of firm and overall-level data, investigate the implication that real and financial influences have on the imperfections of capital market. The authors do so by looking into the sensitivity of the effects of macroeconomic movements in both financially constrained and unconstrained firms and it is done by the construction of financial constraint return factors[7]. The research shows that the constraint factors are, both statistically and economically, significant. More specifically, the returns of constrained firms' increase in relation to the returns of unconstrained firms' in a period of expansion and credit easing. The results suggest the systematic risk of financially constrained firms is higher and that the constraint risk is priced in financial markets. The financial constraint factor, calculated by the authors, shows a correlation with the macroeconomic movements which are predicted by existing theories: the stock returns for firms which are financially constraints underperform those for unconstrained firms when there are downturns and tight credit condition and outperform when constraints are relaxed.

[6] The information used by the authors includes statements regarding the strength of a firm's liquidity; furthermore, the ability of the firm to raise external funds as needed.

[7] The financial constraint return factors are the differences of returns between financially constrained and unconstrained firms.

2.5 – Capital Control

In the study of stock markets, stock market returns, emerging and developing economies and financial development, it is important to include the topic of capital control. A capital control is defined by Christopher Neely (1999), as a policy meant to create a limit or to reassign capital account transactions. As per Schindler (2009), the significance of the cross-border financial assets holding has skyrocketed from under 50% of the world GDP in 1970 to over 300% in 2006.

While the factors of capital control can be seen to have a variety of benefits such as, allowing its government and citizens to lend abroad (this lending would allow domestic investment to veer from domestic saving, which in turn could promote economic efficiency and growth), and allowing for diversification of international portfolio. However, the capital flows are also blamed for being responsible for the spreading of economic disturbances or as a way in which investors elicit a stop, which may cause an economy to crash (Fernández, Klein, Rebucci, Schindler and Uribe, 2015).

Blundell-Wignall and Roulet (2013) state that there are several negative effects from capital control based on the economic theory. Some of the effects are: a reduction of supply of capital; a raise in the cost of financing; domestic firms that do not have access to international capital markets will see an increase in financial constraints; increase of corruption or risk; the reduction of property rights so that the approvals for long-term investors are excluded; and it leads to costly effects of avoidance and enforcement. The authors also make note of the fact that there is considerable microeconomic evidence that shows that if emerging countries lift capital controls, they experience the positive effects that are outlines in the economic theory.

Ghosh and Qureshi (2016) investigate the history of capital controls and why capital controls on capital inflows have had a bad name. There are several reason referenced which may have given capital inflows a bad name. The first factor that is mention is that of completely linked to the capital outflow controls which have been historically linked to autocratic regimes, failed macroeconomic policies and financial crisis. The second reason is that as countries aimed at higher trade integration, capital control became viewed as incompatible as capital account restriction became seen as being linked to current account restriction. The authors concluded that, while capital inflows are not a perfect instrument which manage financial and macroeconomic-stability risk, there is really no reason to think that they are worst or of higher cost than any other policy measure.

Until 1995, the capital control index, created by collecting information from the *Annual Report on Exchange Arrangements and Exchange Restrictions* (AREAER) which is published by the International Monetary Fund, was summarized by using a binary variable where 1 represents a restricted capital account and 0 represents an unrestricted capital account. After 1995, AREAER has used a more structure approached, which served to provide more detailed information. Schindler's (2009) work creates a new panel data set, which contains measure of *du jure* restriction on transactions across-borders. While the *du jure* measures are under the policy maker's direct control, *de facto* measures of financial globalization are available to the public for a large number of countries and years. Schindler's (2009) new index is able to provide a more significant comparison of the levels of restrictions across regions.

Due to this new detailed information, researchers have started to integrate the distinction in the inflow/outflow of capital control, how capital controls affect an economy (Prati, Schindler and Valenzuela, 2008) and investigate the link between *de jure* and *de facto* measures on the restrictiveness of capital account (Dell'Ariccia, 2008). Furthermore, Henry (2007) used the du jure measures in order to date reform events. Schindler's (2009) concludes his work by stating that the data proposed by his work could help in better understanding the process of financial globalization.

3. DATA AND METHODS OF RESEARCH

In this research, we will be following an applied nature in order to investigate if financial development, financial constraints, and capital control have an effect on stock returns. The topic is approached in a quantitative and exploratory manner. The purpose of this chapter is to introduce and provide a brief description of the database that was used in order to make this work possible, the methodology, and econometric models that are used in order to analyze the relationship between financial development and stock returns (Gil, 1994).

This chapter is divided into 2 sections. In section 3.1, the databased used in this work is described, which involves discussing the origin of the data, and the separation of the variables used. The principal variables used in the estimation models are also described in this section. In section 3.2, the econometric models used in order to investigate how stock returns are affected by financial development variables and three financial constraints index.

3.1 Data

This paper consists of firm-level and country-level data in order to implement the proposed empirical model. All data used is in U.S dollars due to the fact that the various economies are studied and it is useful to look at this information from the perspective of an international investor rather than a local one. The firm-level data covers 14,728 listed companies (divided into 5,442 firms located in emerging countries and 9,286 firms in developed countries) in 88 countries from the period of 2004 to 2016. All the information dealing with firm-level data was collected from the ORBIS database, which contains information of over 200 million companies worldwide. A complete description of all variables and a list of all countries, divided by emerging and developed, are in Table A and B (see Appendix)

The variables associated with the measure of financial development are from the database Global Financial Development Database (World Bank) of Čihák, Demirgüç-Kunt, Feyen, and Levine (2013), updated in June 2017. We employ country-level variables to analyze the association between stock market returns and macroeconomic conditions.

As one of the focus of this study is to understand the effects of financial development in stock returns, we employ four measures of the financial system following the study of Čihák et al. (2012). The first measurement of financial development is that of *Depth*, which is a proxy, used to approximate the size of the stock markets. This variable is defined as the sum of stock market capitalization to GDP (which is the most common choice when approximating the size

of stock markets) and the outstanding volume of debt securities (private and public) to GDP (which is the most common choice for bond markets).

The second variable used in measuring financial development is *Access* which is used as to describe the degree to which the public can access financial market. The access financial development variable addresses the characteristics of a functioning financial systems overcoming market friction. This will provide financial services to diverse firms and household, and will not focus on the large firms and wealthy individuals. This measurement is comprised of market concentration, which reasons that a higher degree of concentration indicates greater difficulties for access for newer or smaller issuers. This proxy is defined as the percentage of market capitalization outside of the top 10 largest companies.

The third measure of financial development that is used is *Efficiency*, which takes into consideration the intermediating resources and the facilitation of financial transactions. In financial markets, the emphasis is placed on the measuring of transactions rather than on the direct measurement of the cost of the transactions. The suggested measurement for efficiency is stock market turnover ratio, which is defined as the total value of shares traded during the period divided by the average market capitalization for the period.

Lastly, the fourth measure used to represent stability for financial markets is market volatility. Due to the fact that the financial stability plays an important role in the broader topic of macroeconomic stability, this issue is often independently researched. This variable is defined as the average of the 360-day volatility of the national stock market index.

The independent variables in our analysis come from multiple sources. The data for openness, GDP growth rate, and real interest rate were collected from the World Bank's World Development Indicators. The variables used in the creation of the indexes of financial constraints have been deflated. The index used in order to measure capital control was gathered from the work written by Fernandez, Klein, Rebucci, and Schinlder and Uribe (2015).

The capital control variable that was used in this work is an overall capital control variable. First, the capital control inflow is calculated based on the average of the inflow of 10 asset categorizations. Then, the capital control outflow is calculated the same way. Once the capital inflows and outflows are calculated, the average of the inflow and the outflow will give the overall capital control of a country.

In an attempt to explain a firm's stock return, first we employ a panel data model considering: 1) the Fama and French three-factor model, 2) macroeconomic variables and 3) financial development variables. The Fama and French three-factor model is constructed taking into consideration data for each country. Second, while still using the variables mentioned

above, we divided the emerging and developed countries group by capital control, the emerging countries having high capital control and developed countries having low capital control, as well as considering the three financial constraint indexes and the interaction of financial constraints with capital control and financial constraints with GDP growth. Panel data, otherwise known as longitudinal data, is characterized by collecting the information for the same firms over a period of time. There are several advantages that come from working with panel data. Due to the number of observations, the models that are used over the sample allow for a higher degree of freedom over the estimation of the parameters at the moment that they are analyzed. As a consequence of a higher degree of freedom, the inferences are more efficient. Another advantage is that the use of longitudinal data allows for a better consideration of the dynamic nature in many economic models.

It is important to note that observations in panel allows the control of other characteristic that may influence the results which were not controlled for with t

3.2. Empirical model and estimation

To estimate the impact of the Fama-French three-factor model, macroeconomic variables and financial development on stock return, we use the fixed effect model for considering the heteroscedasticity-robust estimator. The equation (1) represents a general model which will be expressed in different versions as data is classified in different groups.

$$R_{it} = \alpha_i + \beta_1 Fama\_French_t + \beta_2 Macro\_variables_t + \beta_3 FD\_variables_t + \varepsilon_{it} \qquad (3)$$

where R_{it} is the stock return; i is the firm; t is the year; α_i is the firm-specific effect; $Fama\_French_t$ are the variables used dealing with the three factor model which are: Risk Premim, SMB, and HML. $Macro\_variables_t$ are the variables used dealing with the macroeconomic variables such as the GDP growth, real interest rate, openness, capital control and liquidity; $FD\_variables_{it}$ indicates the different financial development variables; and ε_{it} is the error term.

The data will be first classified into emerging and developed countries. By generating these two groups, we are able to compare the effects that the three set of variables may have on stock returns depending on the group. We also separate the sample considering the three financial constraints to investigate the impact of three set of variables, on stock returns for emerging and develop countries with the presence of financial constraints on firms.

In order to examine the presence of financial constraint, we use three different indexes: the KZ, WW and SA index. These financial constraints indexes are constructed in a way that the higher the value of the index, the higher the financial constraint of the firm. The value of each index is calculated for each firm. In order to do so, the sample was divided into tertiles based on the values of the index and then the firms classified in ascending order. The first of the tertiles was classified as being financially unconstrained, and the firms that belong to the last of the tertiles were classified as being financially constrained.

Over the years, there have been multiple ways and indexes that financial constraints have been measured; however, for the purpose of this paper, we will be looking at the KZ, WW and SA index. While the KZ index does not use size, the WW and SA mostly rely on size. It is for this reason that the sign for both WW and SA are expected to match.

The KZ index, which was proposed by Lamont et al (2001), follows the following equation:

$$KZ_{it} = -\left(1.0019\frac{CF}{K_{t-1}}\right)_{it} + (0{,}2826Q)_{it} + \left(3.1392\frac{D}{TotCap}\right)_{it} - \left(39.3678\frac{Div}{K_{t-1}}\right)_{it} - \left(1.3148\frac{Cash}{K_{t-1}}\right)_{it} \quad (4)$$

where *i* is the firm; *t* is the year; K_i is the fixed assets; CF_{it} is the cash flow variable; Q_{it} is the Tobin's Q; D_{it} is the debt variable; TotCap_{it} is the total capital defined as the sum of debt plus stockholders' equity; Div_{it} is the dividends and Cash_{it} is the cash, defined as cash plus short-term investments.

Whited and Wu (2006) suggested another index, which is aptly name the WW index. This index is shown through the following equation:

$$WW_{it} = -0.091\left(\frac{CF}{TA}\right)_{it} - 0.062DDIV_{it} + 0.021\left(\frac{LTD}{TA}\right)_{it} - 0.044Size_{it} + 0.102ISG_{it} - 0.035SG_{it} \quad (5)$$

where *i* is the firm; *t* is the year; CF_i is the cash flow variable; TA_{it} is the total assets; $DDIV_{it}$ is a dividend payer dummy; LTD_{it} is the long-term debt; $Size_{it}$ is the logarithm of the firm's total assets; ISG_{it} is the industry's sales growth and SG_{it} is the firm's sales growth.

Hadlock and Pierce (2010) create an index, which uses two of the most relative exogenous variables, firm size and age, otherwise known as the SA-index. Due to the fact that this index can be calculated for each individual firm, this financial constraint index is said to be

firm-specific. Furthermore, this index is capable of coping with time varying changes, meaning that a firm can alter from a degree of financial constraints during a particular period (Clearly, 1999), while being continuous and facilitating the usage of this index.

$$SA_{it} = -0.737S_{it} + 0.043S_{it^2} - 0.040A_{it} \quad (6)$$

where *i* is the firm; *t* is the year; S is the firm's size and A is the firm's age. The size of the firm is calculated as the logarithm of book assets. Also, age is defined by the number of years in activity (Silva and Carreira, 2010).

4. RESULTS

This chapter present the results which were obtained based the estimations of the effects of financial development, financial constraint and capital control on stock returns in emerging and developed markets. In order to consider heterogeneity within the observation in the sample, a robust model was estimated. The classification of financial constraints was possible to due to the use of three specific indexes of financial constraints: KZ, WW and SA. The section is divided as follows: Section 4.1 provides an overview of the aggregate view of descriptive statistics from an overall point of view as well as the emerging and developed economies; Section 4.2 presents the results from the fixed effect regressions.

4.1 Descriptive Statistics

The descriptive statistics of the date helps to understand some of the features of the specific dataset. The advantage of the descriptive statistics in our case is that they allow the interpretation of raw data.

Table 1 shows the mean and the standard deviation of the main variables used in this work for the sample as a whole as well as separated by emerging and markets.

Table 1: Descriptive statistics for all sample and for developed and emerging group.

VARIABLES	All Sample		Emerging		Developed	
	Mean	Std. dev.	Mean	Std. dev.	Mean	Std. dev.
Stock Return	0.095	0.641	0.125	0.680	0.078	0.617
Risk Premium	0.070	0.285	0.129	0.394	0.032	0.171
SMB	-.0146	0.192	-0.099	0.222	-0.185	0.151
HML	-0.157	0.252	-0.187	0.268	-0.132	0.235
GDP Growth	3.747	3.710	6.467	3.643	1.905	2.386
Real Interest Rate	3.158	4.485	3.665	6.582	2.819	2.079
Capital Control	0.369	0.377	0.774	0.271	0.103	0.100
Openness	0.718	0.687	0.739	0.414	0.702	0.825
Depth	1.419	0.852	0.936	0.555	1.677	0.870
Access	4.141	0.307	4.135	0.278	4.145	0.321
Efficiency	1.062	0.802	0.909	0.979	1.165	0.636
Stability	0.207	0.092	0.229	0.103	0.192	0.080
Liquidity	0.835	0.390	0.689	0.360	0.940	0.377

This table shows the mean and the standard deviation of variables by the overall sample, then divided into emerging and developed economies.

It can be seen that the mean of the stock returns for emerging markets are significantly higher than those of developed countries; likewise, the standard deviation is higher for emerging economies than for developed in addition to being well about the average for the whole sample.

The variables used in the Fama and French three-factor models are shown and the risk premium variable shows that for both, developed and emerging economies, the risk free rate is higher than the market risk rate. The mean and the standard deviation for the risk premium value are significantly higher for emerging economies. The result of the SMB variable goes against the Fama and French theory that states that small capitalization stock stereotypically outperforms large capitalization stocks. The mean for the SMB variable is negative, which implies that the average small size companies with small capitalization tend to achieve lower return than large size companies with large capitalization. One possible reason for this results may be due to the market experiencing a sharp decline, as it did in 2008, where investors could prefer to invest in larger companies and take less risk in their investments.

The HML variable has a negative value which means that stock with a high BE/ME ratio (value stocks) underperform stock with a low BE/ME (growth stocks). The HML variable has a bigger mean and standard deviation for emerging economies, which implies that growth stocks are earning higher stock returns than value stocks. While this goes against Fama-French theory, the reason may have to with the fact interest rates have been kept low since the 2008 collapse.

When looking at macroeconomic variables, GDP growth, Real Interest Rate, Capital Control and Openness, we see that the mean of the variables is significantly higher for emerging economies. As seen in the table, the average of the GDP growth rate for the overall sample was 3.747%. This percentage is significantly lower than that of emerging economies which is 6.467% and significantly higher than those of developed economies which is 1.905%. The GDP growth of rate of the developed economies is 4.562% lower than those of the emerging economies showing a clear difference between the two groups analyzed.

Openness, which is described as the sum of a country´s export and import divided by GDP is higher for developed economies signifying that there is a greater degree of trade openness for these economies. It is important to note that the standard deviation for developed economies (0.825) is also higher than those for emerging countries (0.414) and that of the overall (0.718). It could be related to the exposure to multiple trading markets, or exchange rate changes among other variables.

Most of the means of the financial development variables are higher for developed economies. More specifically, the variables dealing with access, efficiency and stability are

higher for developed countries. Stability is higher for emerging economies, based on the fact that stock price volatility is used to measure the stability of the market, the significant difference can be attributed to the risk of investing in the developed countries being smaller than in the emerging countries. Lastly, developed economies have a higher mean in liquidity, while the standard deviation is higher for emerging markets.

In Table 2, we show the descriptive statistics for firms classified by financial constraints. Panel A shows the mean and the standard deviation for emerging countries while Panel B shows the same information for developed countries.

Table 2: Descriptive statistics by financial constrained groups

Variables	KZ Index				WW Index				SA Index			
	Constrained		Unconstrained		Constrained		Unconstrained		Constrained		Unconstrained	
	Mean	SD	Mean	SD.	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Panel A: Emerging Countries												
Stock Return	0.219	0.724	0.142	0.629	0.222	0.692	0.147	0.558	0.047	0.601	0.103	0.701
Risk Premium	0.054	0.223	0.022	0.245	0.025	0.231	0.048	0.263	-0.038	0.246	0.020	0.241
SMB	-0.154	0.225	-0.126	0.233	-0.189	0.269	-0.080	0.193	-0.055	0.216	-0.192	0.227
HML	-0.232	0.251	-0.184	0.293	-0.186	0.261	-0.202	0.293	-0.148	0.262	-0.218	0.241
Tobin's Q	0.776	1.532	1.282	1.712	0.987	1.343	0.929	1.146	1.001	1.844	0.964	2.080
Size	12.946	2.150	10.838	2.081	10.566	1.123	14.999	0.989	14.347	2.553	10.022	2.018
Market Value	5.014	2.573	3.695	2.442	3.120	1.561	7.429	1.213	5.610	2.547	2.700	2.349
Sales Growth	1.022	0.165	1.017	0.248	1.019	0.107	1.031	0.162	1.026	0.185	1.002	0.238
Dividends rate	0.009	0.022	0.036	0.099	0.042	0.095	0.025	0.074	0.019	0.037	0.015	0.315
Debt rate	0.729	1.463	0.304	0.399	0.414	0.252	0.542	0.185	0.542	0.479	0.556	0.690
Cash Flow rate	0.050	0.245	0.081	0.284	0.107	0.082	0.083	0.158	0.069	0.107	0.538	0.149
Panel B: Developed *Countries*												
Stock Return	0.122	0.539	0.125	0.724	0.165	0.506	0.108	0.365	0.059	0.618	0.048	0.511
Risk Premium	0.029	0.183	0.009	0.152	0.034	0.182	0.025	0.183	-0.035	0.178	-0.016	0.207
SMB	-0.175	0.174	-0.196	0.118	-0.168	0.146	-0.149	0.156	-0.197	0.152	-0.165	0.153
HML	-0.106	0.232	-0.202	0.224	-0.139	0.206	-0.103	0.192	-0.138	0.264	-0.112	0.200
Tobin's Q	1.208	2.734	1.442	1.923	1.108	1.508	0.803	0.850	1.580	3.364	0.892	1.915
Size	13.207	2.456	10.768	1.836	11.115	0.839	15.333	1.159	13.933	3.444	12.105	2.296
Market Value	5.651	2.387	3.669	1.919	3.814	1.005	7.785	1.132	5.499	2.623	4.593	2.246
Sales Growth	1.013	0.157	1.020	0.256	1.006	0.072	1.007	0.078	1.029	0.247	0.998	0.142
Dividends rate	0.013	0.024	0.018	0.038	0.035	0.043	0.020	0.023	0.014	0.027	0.013	0.027
Debt rate	0.667	0.758	0.347	0.434	0.427	0.297	0.526	0.185	0.734	1.240	0.529	0.482
Cash Flow rate	0.082	0.319	-0.052	0.335	0.095	0.085	0.079	0.052	-0.011	0.327	0.022	0.221

This table shows the mean and the standard deviation of variables by financial constrained groups.

Panel A does not present high differences between the indexes for stock return and risk premium in the KZ and WW index. The mean the stock return for both the constrained and unconstrained firms in the SA index are lower than those of the KZ and WW. Furthermore, the average for the risk premium of constrained firms in the SA index is negative implying that market rate is higher than the risk free rate.

While a difference can be seen between the KZ and WW index when observing the mean and standard deviation of financially constrained and unconstrained firms, the difference is more markets when looking at the SA index. A high difference can be seen between the WW and SA indexes for variable SMB, this may be to the fact that both indexes are constructed based on size of firms. The Tobin's *Q*, represented by the firm market capitalization divided by the total assets, is lower for the constrained firms in KZ index than for the WW or the SA index; however, the unconstrained firms contain the highest value of all three indexes. When looking at size, financially unconstrained firms in the WW index has the highest mean at 14.999 while KZ and SA are relatively similar at 10.838 and 10.022 respectively. On the other hand, financially constrained firms in the WW index have the lowest mean at 10.566, while the KZ index shows 12.946 and the SA index 14.347.

The more pronounced difference when looking at the market value is that of financially unconstrained firms in the WW index. This mean is higher than all other means, regardless of the whether it is financially constrained or unconstrained. On the same note, the financially constrained firms have the lowest value when compared to the other financially constrained firms in the KZ and SA index. Sales growth seems to remain relatively constant throughout all three indexes.

The dividends rate for the SA index for constrained firms is approximately twice the size of those firms for the KZ index, and the WW index means for the same firms are approximately five times the size. However, when looking at the financially unconstrained firms, the KZ index has the highest mean at 0.036, followed by the WW index at 0.025 and lastly the SA index at 0.015. While the mean of the debt rate for both, financially constraint and financially unconstrained firms for the WW and SA index, remain close to each other, the mean for the financially constrained firms in the KZ index is higher than in the other indexes and the mean is lower. When considering cash flow rate, financially constrained firms for the WW index and the SA index are twice the size of that of the financially constrained firms in the KZ index while the financially unconstrained firms for the SA index are 0.45% bigger.

When analyzing panel B, we look at developed countries. The stock returns for financially constrained and financially unconstrained firms in developed countries are

significantly higher for the KZ and the WW index than those in the SA index. While the risk premium for the SA index is negative for both constrained and unconstrained firms, the mean for KZ and WW index are positive. The negative sign when looking at the mean implies that that market rate is higher than the risk free rate. The SMB values are negative for all indexes implying big capitalization firms outperform small capitalization firms. The lowest mean for the financially constrained firms is represented in the SA index while the highest is for those classified under the WW index. The KZ index is approximately three times the size of those under the SA index. For unconstrained firms, the mean for the WW index is -0.080, while in the KZ index this group is approximately 0.04 higher and the SA index is about twice the size. The HML mean is also negative which implies that the growth stocks outperform the value stocks. While the values remain relatively similar for the financially constrained firms, the financially unconstrained firms in the KZ index are approximately twice the size of those in the WW and SA index.

The Tobin's q for constrained firms are higher for the SA index than for the KZ and WW index; however, unconstrained firms under the KZ index have a higher mean than those under the WW and SA index. The size of the WW index for constrained firms is 11.115 which is slightly less than the 13.207 of the KZ index and the 13.933 of the SA index; however, the WW index for financially constrained firms have the higher mean with 15.333 while the SA index has a mean of 12.102 and the KZ has a 10.768 mean.

The market values for financially constrained firms for both the KZ index and the SA index is approximately the same while it is slightly less for the WW index. Financially constrained firms for the WW index has the higher mean at 7.785, while the KZ and the SA index are significantly lower at 3.669 and 4.593 respectively. Furthermore, the differences between sales growth in all three indexes for financially constrained and financially unconstrained firms are very small.

The dividends rate for the WW index for constrained firms is approximately twice the size of those firms for the KZ index and the SA index. However, when looking at the financially unconstrained firms, the WW index has the highest mean at 0.020, followed by the KZ index at 0.018 and lastly the SA index at 0.013. While the mean of the debt rate for both, financially constraint and financially constrained firms for the KZ and SA index, remain close to each other, the mean for the financially constrained firms in the WW index is lower. The mean for financially unconstrained firms for the KZ index is lower than both WW and SA indexes at 0.347. When considering cash flow rate, financially constrained firms for the KZ index and the WW index are approximately 8 times the size of those of the SA index. However, the

unconstrained firms of the KZ index are significantly lower at -0.052 than both the WW index at 0.079 and the SA index at 0.022.

An illustration of the stock return for both emerging and developed countries for the years 2004 to 2016 is shown below.

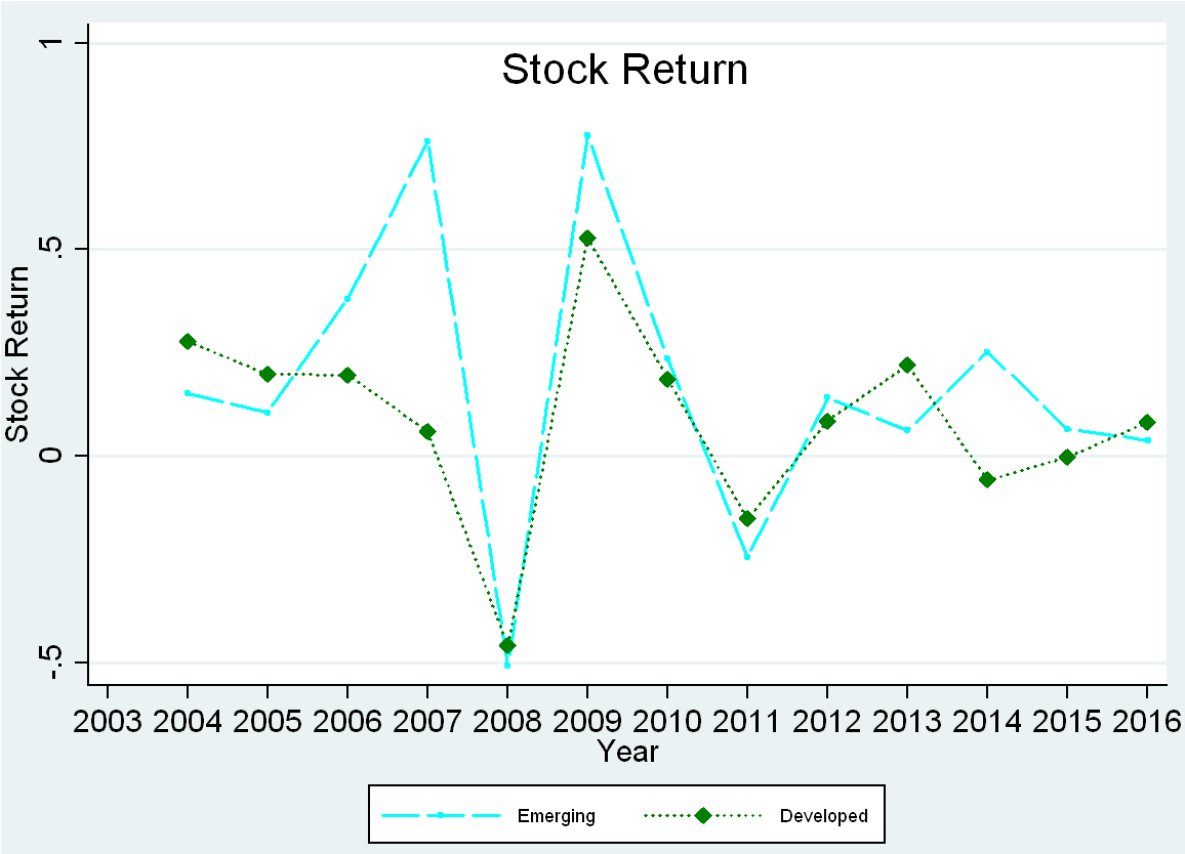

Figure 1 - Stock Returns for Emerging and Developed Countries
Source: Own autorship based on the information from the Global Financial Development Database by Čihák, Demirgüç-Kunt ,Feyen and Levine.

The idea that emerging markets have higher returns than those of the developed countries is confirmed in figure 1. The sharp decline due to the 2008 financial crises is there for both countries and we see that the recovery of emerging countries was higher and slightly faster than those for developed countries. This may due to the fact that due to the instability of the market of the developed countries, they were looking to new markets in which to invest their capital. Furthermore, since the emerging markets seem to have higher level of capital control, they may have been insulated for longer period of time before the crisis. During the period of 2013 through 2016, the relationship between the stock returns of emerging markets and those of the developed market seem to be negative. While the stock returns for developed markets rose, the ones for emerging markets decline and vice versa.

Figure 2 shows the progression of the level of liquidity for emerging and developed countries. Unfortunately, since there was missing information in our database for private credit sectors to GDP, which is a proxy for liquidity, our parameter starts at 2008.

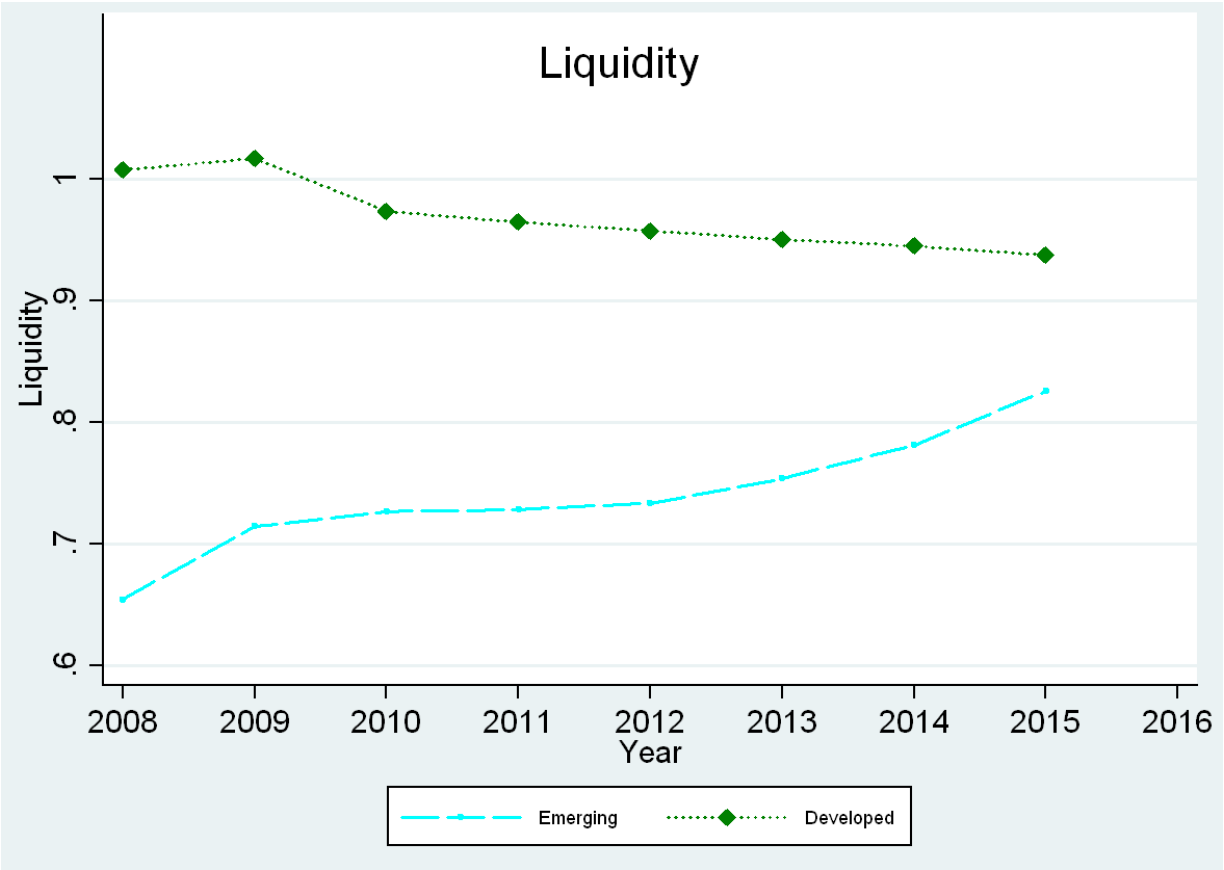

Figure 2 Liquidity for Emerging and Developed
Source: Own autorship based on the information from the Global Financial Development Database by Čihák, Demirgüç-Kunt ,Feyen and Levine

When looking at liquidity, we see that the while there has been a slight decline in developed countries (less than 0.1), while the emerging countries have increase significantly (from 0.65 to 0.085).

4.2 The results of the estimations

Table 3 present the estimations of the fixed effect model for four models for emerging and four developed countries. In order to analyze the effects of the Fama and French (1993) three- factor model, the macroeconomic and financial development variables on stock returns, we estimate four models by adding a set of group variables in each model. Our analysis will be focused on model (4), which contain all variables and is based on the criteria Bayesian information criterion (BIC) and Akaike information criterion (AIC).

In analyzing the emerging countries first, we note that the risk premium and the SMB (Small Minus Big), which represents the difference between the average returns of small and big firms, are positive and significant in order to explain the stock returns. On the other hand, the HML (High Minus Low) variable, which represents the difference between the average of the returns of high book-to-market ratio and low book-to-market ratio, is negative and significant. This indicates that low growth portfolios have higher market capitalization than those of high growth portfolios for emerging countries.

Table 3: Fixed-Effect Robust Regression.

	Emerging				Developed			
Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Risk Premium	0.163***	-0.053*	0.880***	0.802***	0.378***	0.289***	1.009***	0.757***
	(0.023)	(0.027)	(0.035)	(0.040)	(0.013)	(0.017)	(0.030)	(0.054)
SMB	0.738***	0.327***	0.167***	0.504***	0.441***	0.320***	0.065*	0.277***
	(0.033)	(0.030)	(0.030)	(0.036)	(0.027)	(0.028)	(0.035)	(0.040)
HML	0.530***	0.645***	0.122***	-0.349***	0.707***	0.780***	0.673***	-1.052***
	(0.024)	(0.023)	(0.023)	(0.024)	(0.023)	(0.022)	(0.025)	(0.029)
GDP Growth$_{t-1}$		0.107***		-0.097***		0.052***		-0.024***
		(0.002)		(0.003)		(0.001)		(0.002)
Real Interest Rate$_{t-1}$		0.005***		-0.023***		0.021***		0.062***
		(0.002)		(0.002)		(0.002)		(0.003)
Capital Control$_{t-1}$		0.234***		-1.190***		0.732***		-1.609***
		(0.069)		(0.092)		(0.069)		(0.116)
Openness		2.143***		0.604***		0.916***		0.529***
		(0.067)		(0.124)		(0.038)		(0.047)
Depth			2.786***	-1.768***			0.411***	-0.277***
			(0.051)	(0.061)			(0.021)	(0.036)
Access			0.352***	-0.866***			0.842***	1.684***
			(0.121)	(0.124)			(0.043)	(0.065)
Efficiency			0.050***	-0.238***			0.165***	0.300***
			(0.013)	(0.017)			(0.016)	(0.021)
Stability			6.791***	6.511***			3.512***	3.233***
			(0.126)	(0.136)			(0.065)	(0.108)
Liquidity			2.508***	3.339***			0.013	-2.584***
			(0.167)	(0.175)			(0.065)	(0.113)
AIC	72477	68151	42797	40735	91151	83725	62787	59758
BIC	72502	68211	42863	40833	91178	83788	62858	59861
R-squared	0.071	0.178	0.377	0.424	0.077	0.144	0.234	0.257
Number of Firms	6,206	6,206	5,442	5,442	11,046	11,038	9,525	9,286
Observations	35,553	35,553	26,557	26,557	57,185	55,581	41,880	41,012

The dependent variable is stock return. The table represents the fixed-effect robust regression considering financial constraints. Robust standard errors are in parentheses. The symbols *, ** and *** represent the significance of estimators for 10%, 5% and 1% respectively

The effects of macroeconomic variables, such as GDP growth and real interest rate, capital control on stock return are found to be negative and significant. For the openness variable, the effect is positive and significant, although greater trade openness makes domestic

firms - and hence domestic stock returns - more susceptible to world economic conditions (Dellas and Hess, 2005).

When dealing with financial development variables, the results show a negative impact the depth, access and efficiency on stock returns. Since depth measures the size of the stock market, we must note that if there is an increase in the size of the stock market, there will be decrease in the stock returns of the firms. This also happens for access and efficiency variables and could represent a higher level of competition of the capital market. The variables dealing with stability and liquidity have a positive impact on stock return. As stability here represents stock price volatility, the results agree with the theory in that the higher the risk, the higher the stock returns. As emerging countries are more in need of liquidity, an increase of this variable could provide a positive impact on stock return.

By analyzing developed countries, we observe that the results are similar to those of the emerging countries variables of the Fama and French three factor model. The more pronounced difference between emerging and developed countries is seen in relation to the HML variable, which for the developed countries the parameter is more than twice the value of that of emerging countries. When considering the macroeconomic variables, the main difference is observed for the real interest rate, with a positive impact on stock returns.

For financial development variables, depth and liquidity have a negative impact on stock returns. For depth, which represents size of the market, a higher market could imply more competition and reduce the stock returns. The negative impact on stock returns of the liquidity variable in developed countries could be due to the channeling of private credit to the betterment endeavors instead of financial markets. The variables of access, efficiency and stability have a positive impact on stock returns. Similar as emerging countries, more risk implies more stock returns. The positive impact on stock returns of access and efficiency could be due to lower concentration and reduces the difficulties in the entry to newer and smaller issuers.

In order to better understand the presence of financial constraints and the role of capital control on the stock returns we use the following three financial constraints indexes: KZ, WW and SA. In addition, to capture the effect of capital control for constrained firms we include the interactions of high and low capital control with financially constrained firms. With this purpose we classify the sample of emerging and developed countries as having by capital control and interact them with the indexes of financial constraints. We also check the role of economic activity and financial constraints on asset prices. Table 4 presents the estimates of six models considering these interactions for emerging and developed countries.

Table 4. Fixed-Effect Robust Regression considering financial constraints and capital control.

	Emerging (High Control)			Developed (Low Control)		
Variables	(1)	(2)	(3)	(4)	(5)	(6)
Risk Premium	-0.244***	-0.354***	1.261***	0.345***	0.552***	1.154***
	(0.0691)	(0.0874)	(0.0392)	(0.0573)	(0.0722)	(0.0366)
SMB	-0.0527	-0.127***	-0.200***	0.484***	0.271***	0.0365
	(0.0320)	(0.0413)	(0.0362)	(0.0646)	(0.0695)	(0.0403)
HML	-0.233***	-0.0893**	-0.332***	-0.970***	-0.600***	-0.796***
	(0.0297)	(0.0361)	(0.0343)	(0.0415)	(0.0558)	(0.0278)
Real Interest Rate$_{t-1}$	0.0217***	0.0329***	0.00144	-0.0185***	-0.00737	0.0382***
	(0.00184)	(0.00253)	(0.00196)	(0.00353)	(0.00512)	(0.00304)
Openness$_{t-1}$	2.858***	2.594***	2.855***	0.696***	0.634***	0.581***
	(0.202)	(0.248)	(0.139)	(0.0571)	(0.0796)	(0.0509)
Depth	-0.772***	-1.082***	-2.019***	-0.232***	-0.243***	-0.250***
	(0.0777)	(0.0979)	(0.0797)	(0.0310)	(0.0345)	(0.0228)
Access	1.684***	0.835***	-0.483***	-0.218**	-0.646***	0.843***
	(0.241)	(0.307)	(0.160)	(0.0987)	(0.106)	(0.0473)
Efficiency	0.0100	0.0724**	-0.219***	0.687***	0.675***	0.146***
	(0.0261)	(0.0323)	(0.0161)	(0.0474)	(0.0508)	(0.0178)
Stability	5.380***	5.524***	6.581***	2.121***	1.636***	3.503***
	(0.175)	(0.224)	(0.140)	(0.126)	(0.144)	(0.0701)
Liquidity	1.128***	0.981**	3.947***	-0.654***	-0.568***	-0.775***
	(0.331)	(0.424)	(0.190)	(0.121)	(0.143)	(0.0782)
KZ$_{CONST}$	-0.340***			0.307***		
	(0.0777)			(0.0620)		
Control KZ$_{CONST}$*	0.220***			-0.405***		
	(0.0752)			(0.0648)		
GDP growth KZ$_{CONST}$*	0.0156**			0.0243***		
	(0.00694)			(0.00263)		
WW$_{CONST}$		-0.410***			0.238***	
		(0.149)			(0.0686)	
*Control*WW$_{CONST}$*		-0.0651			-0.419***	
		(0.144)			(0.0720)	
GDP growth WW$_{CONST}$*		0.0377***			0.0119***	
		(0.00886)			(0.00314)	
SA$_{CONST}$			-0.459***			0.0704
			(0.0880)			(0.0553)
Control SACONST*			0.543***			-0.180***
			(0.0790)			(0.0680)
GDP growth SACONST*			0.00223			0.0133***
			(0.00743)			(0.00369)
R-squared	0.397	0.435	0.426	0.216	0.193	0.247
Number of Firms	4,902	3,477	4,072	6,305	4,131	7,574
Observations	20,427	12,050	17,568	23,867	14,311	33,761

The dependent variable is stock return. The table represents the fixed-effect robust regression considering financial constraints. Robust standard errors are in parentheses. The symbols *, ** and *** represent the significance of estimators for 10%, 5% and 1% respectively. The interaction of Control* *KZCONST* indicate financial constraints with high capital control when countries are emerging and low capital control when countries are developed.

First, we analyze the results of emerging countries, which, according Table 4, indicate that financial constraints have a negative and significant impact on stock returns for all three indexes of financial constraints. The interaction of the financial constraints with capital control suggests that more capital control associated with financial constraints increase stock returns. High capital control of the emerging countries could imply a reduction of the ease to withdraw the money by the external investors. The benefits here for emerging countries may come from a possible reduction of the economic instability given that these countries are not fully stable and are more sensitive to economic disturbances and more subjected to international capital flows.

On the other hand, more economic activity has a positive impact on stock return even when the firms are considered financially constrained, for all three indexes of financial constraints. This mean that as the real activity increases in the presence of financial constraints the stock returns will also increases. An explanation regarding this issue is that financially constrained firms in emerging countries are more susceptible to macroeconomics fluctuations, to external credit conditions and are more sensitive on monetary policy. However, it is reasonable to expect that higher economic growth may reduce the factors of financial constraints, and in turn increasing the possibility of firm value growth, which will be reflected on their stock returns.

For developed countries, Table 4 shows that the financial constraints variable by itself has a positive on stock returns for the all three indexes. A possible explanation for this is that the investors could demand higher returns to maintain their stocks, which will have a positive correlation with financial constraints. On the other hand, when we interact financial constraints with capital control we observe a negative impact on stock returns. As developed countries have low capital control, they smooth out the difficulties that restrict the transactions in their country. In developed countries, which are supposedly more stable and less susceptible to economic fluctuations, this dynamic could result lower stock returns for financially constrained firms. The same result is found for all financial constraints indexes.

To check if the economic growth associated with financial constraints factors are connected to stock returns, we interact GDP growth and financial constraints. As result of this interaction we find that an increase in economic activity positively impacts stock returns. This means that higher economic growth may alleviate financial constraints by positive expectations about future better conditions of the economy, future credit conditions, higher expectations regarding future projects and in turn future profit.

5. Conclusions

In this paper, our goal is to investigate the effect that financial development, financial constraint and capital control have on stock returns in emerging and developing countries. In order to do so, we employ the Fama and French (1993) three-factor model with the macroeconomic variable and financial development variables. Additionally, we interact financial constraints with capital control and with economic activity in order to capture both of these effect on stock returns. We consider three financial constraint index suggested in the literature (KZ, WW and SA indexes). To consider te effects of the possible capital liberalization on stock returns, we also classified emerging and developed countries as having high or low capital control. The criterion used to classify the capital control of countries help to better understand the role of the financial globalization process on asset pricing in different economies. Based on the observations, the statement that emerging countries have high capital control while developed countries have low capital control can be made.

An additional idea behind the use of capital control as a classifying factor in this research is that it enables us to investigate the joint impact of capital control and financially constrained firms on stock returns. Additionally, due to the renewed interest in capital controls, the literature has grown; however, it is usually focused on one country. We attempt to observe the differences between the emerging countries, which have high capital control, and the developed countries, which have low capital control. Furthermore, we aim to capture the effect of economic activity interacting with financially constrained firms, as well as with capital control on stock returns. For this purpose, we estimate a robust fixed effect model using panel data with 14,728 firms from 88 countries (emerging and developed) from the period ranging from 2004-2016.

First, by analyzing the chosen model using the AIC and BIC criteria selection models for emerging and developed countries, we find that in emerging countries the variables dealing with risk premium and SMB, as expected based on the Fama and French theory (1992), have a positive impact on stock returns. However, the results for the HML variable, goes against the Fama and French theory (1992) in that it has a negative impact on stock returns. This indicates that low growth portfolios have higher market capitalization than those of high growth portfolios. It is important to mention that the chosen model include macroeconomic and financial development variables in addition to the Fama and French three-factor model.

We also find a relevant and statistically significant effect of macroeconomic variables in stock returns. The capital control variable has a negative effect on stock returns, which may

involve the fact that, as there is an increase of capital control, the inflow and outflows between countries are more difficult which would impact stock returns negatively. Our results agree with Chari and Henry (2004), which state that there is an inverse relationship between capital controls and expected returns.

When dealing with financial development variables, we see that depth, access and efficiency have a negative impact for emerging economies. These results can go back to the fact that if there is a decrease in depth, access or efficiency, the market will be riskier and therefore the stock returns will increase (Fama and French, 1992). Furthermore, liquidity shows a positive and significant relationship with stock returns which agree with the findings from Jun, Marathe and Shawky (2003).

When looking at developed countries, the results for the Fama and French three-factor model are similar to those of the emerging economies in the sense that there is positive relationship between risk premium, SMB and stock returns, but a negative one for HML. The main difference between the emerging and developing economies when dealing with macroeconomic variables is in the real interest rate with a positive impact on stock returns. An increase of the real interest rate for developed countries indicates an increase in stock returns, probably due to greater economic stability of these countries. In this sense, a higher interest rate may encourage the search for higher risk assets with higher returns to these countries. Considering financial development variables, we find similar results for depth, stability variables, although the parameter of the stability is half of the value for emerging economies due to more stable economies. Different to the emerging countries, access and efficiency have a positive impact on stock returns which could indicate a lower level of concentration, decreasing barriers of new entries and smaller issuers. Here, the liquidity variable showed a negative impact on stock returns which could be attributed to the effect of the private credit channel by improving new ventures.

In order to investigate the presence of financial constraints and the role of the capital control on stock returns, we use three financial constrain indexes and interact it with capital control. It also takes into consideration the interaction between financial constraints and GDP growth. The interactions are included in this model in order to see the impact of this variables together on stock returns.

When looking at emerging countries, financial constraints are shown to have negative and significant effect on stock returns. The interaction between financial constraints and high level of capital control presents a positive and significant effect on stock market return. This may be due to the fact that the capital controls are high for emerging countries may deter the

external investors from withdrawing money. Additionally, the positive effects may come from the economic instability being reduced since these countries are not fully stables and more sensitive to economic disturbances on a global level.

Financial constraint is also interacted with GDP growth and the relationship proves to be a positive one for all three financial constraints indexes. This relationship implies that financially constrained firms are more likely to be influence by macroeconomics fluctuations, external credit conditions as well as having a higher sensitivity when looking monetary policy. The inference that a higher economic growth could reduce financial constraints and which would increase possibility of the growth of the firm value, and therefore be reflected on stock returns could be made.

In developed countries, financial constraints show a positive and significant relationship with stock returns for all three indexes. A possible reason for this relationship may be due to the demand of higher returns from investors in order for them to maintain their stocks. However, when the interaction between financial constraints and capital control is observed, the relationship is negative. A possible reason behind this relationship is that due to the fact that developed countries have low capital control, the difficulties restricting transactions into the countries are smoothed out. In developed countries, which are characterized by being more stable and less influenced by economic fluctuation, this relationship results in lower stock returns for these countries.

The effect of economic growth and financial constraints is also observed in developed countries and it shows a significant and positive relationship with stock returns. An increase in economic growth may assuage financial constraints due to positive expectation regarding the future of the economy.

There are future improvements that could be made when dealing emerging and developing countries. A future step is to analyze the same results without taking into consideration countries that are not strictly characterized as emerging or that evade the emerging market characterization. For example, the emerging countries group contain countries that may be big in the market size and in the number of transactions, while the developed groups could only consist of smaller countries. An example of this situation is that of China and Brazil. While China and Brazil are categorized by the IMF as being emerging countries, due to the size of the countries, it may bias. Concisely, it can be stated that the results may be distorted due to heterogeneity.

The result suggests that in a general way, the extended Fama and French three-factor model, including macroeconomic and financial development variables and considering the

presence of financial constraints is important to better understand their impacts on asset pricing for emerging and developed countries alike.

Furthermore, by interacting financial constraints with GDP growth and financial constraints with capital control, the results point out different effects based on whether they belong to emerging or developed countries. These different results based on the emerging and developed countries are an important aspect that should be considered by policy makers.

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APPENDIX

Table A- List of all countries

List of Countries		
Developed	*Emerging*	
Australia	Argentina	Poland
Austria	Bahrain	Qatar
Bangladesh	Bosnia and Herzegovina	Romania
Belgium	Botswana	Russian Federation
Canada	Brazil	Saudi Arabia
Cyprus	Bulgaria	Serbia
Czech Republic	Chile	South Africa
Denmark	China	Sri Lanka
Estonia	Colombia	Thailand
Finland	Costa Rica	Tunisia
France	Croatia	Turkey
Germany	Ecuador	United Arab Emirates
Greece	Egypt, Arab Rep.	Venezuela, RB
Hong Kong SAR, China	Ghana	Vietnam
Iceland	Hungary	
Ireland	India	
Israel	Indonesia	
Italy	Jamaica	
Japan	Jordan	
Korea, Rep.	Kazakhstan	
Latvia	Kenya	
Lithuania	Kuwait	
Luxembourg	Lebanon	
Malta	Macedonia, FYR	
Netherlands	Malaysia	
New Zealand	Mauritius	
Norway	Mexico	
Portugal	Mongolia	
Singapore	Montenegro	
Slovak Republic	Morocco	
Slovenia	Namibia	
Spain	Nigeria	
Sweden	Oman	
Switzerland	Pakistan	
Ukraine	Panama	
United Kingdom	Peru	
United States	Philippines	

Source: International Monetary Fund
http://www.imf.org/external/pubs/ft/weo/2017/01/weodata/groups.htm#wa

Table B - List of Variables

Variables	Description
Firm-Level variables	
Stock Return	(Closing Price$_t$ – Closing Price$_{t-1/}$ Closing Price $_{t-1}$)
SD of Stock Return	Standard deviation of stock returns
Risk Premium	Market risk rate minus Risk free rate
SMB	Average return on the three small portfolios minus the average return on the three big portfolios (Small minus big)
HML	Average return on the two value portfolios minus the average return on the two growth portfolios (High minus low)
Tobin's q	Total Market Value of firm / Total Asset Value
Size	Log (Total Assets)
Market Value	Market capitalization of the country
Sales Growth	Industry's sales growth
Dividend Rate	Total amount of expected dividend payments from investment expected to be received during that period.
Debt Rate	Ratio of total long-term and short-term debt to total assets
Cash flow rate	Firms cash flow divided by total assets
Country-Level Variables	
Company Market Value	Market capitalization of firms (# of shares outstanding times the price per share)
GDP growth	(GDP$_t$ - GDP$_{t-1}$/ GDP$_{t-1}$)
Real Interest rate	Real Interest Rate
Capital Control	Overall Capital Control
Openness	Imports + Exports / GDP
Liquidity	Private Credit by Deposit Money Banks by GDP
Financial Development Variables	
Depth	(Stock market capitalization + Outstanding domestic private debt securities) / GDP
Access	Market Capitalization Excluding Top 10 Companies / Total Market Capitalization
Efficiency	Stock Market Turnover Ratio
Stability	Stock Price Volatility

Figure 3 Capital Control for Emerging and Developed
Source: Own authorship based on the information from the Global Financial Development Database by Fernandez, Klein, Rebucci, Schindler and Uribe (2015)

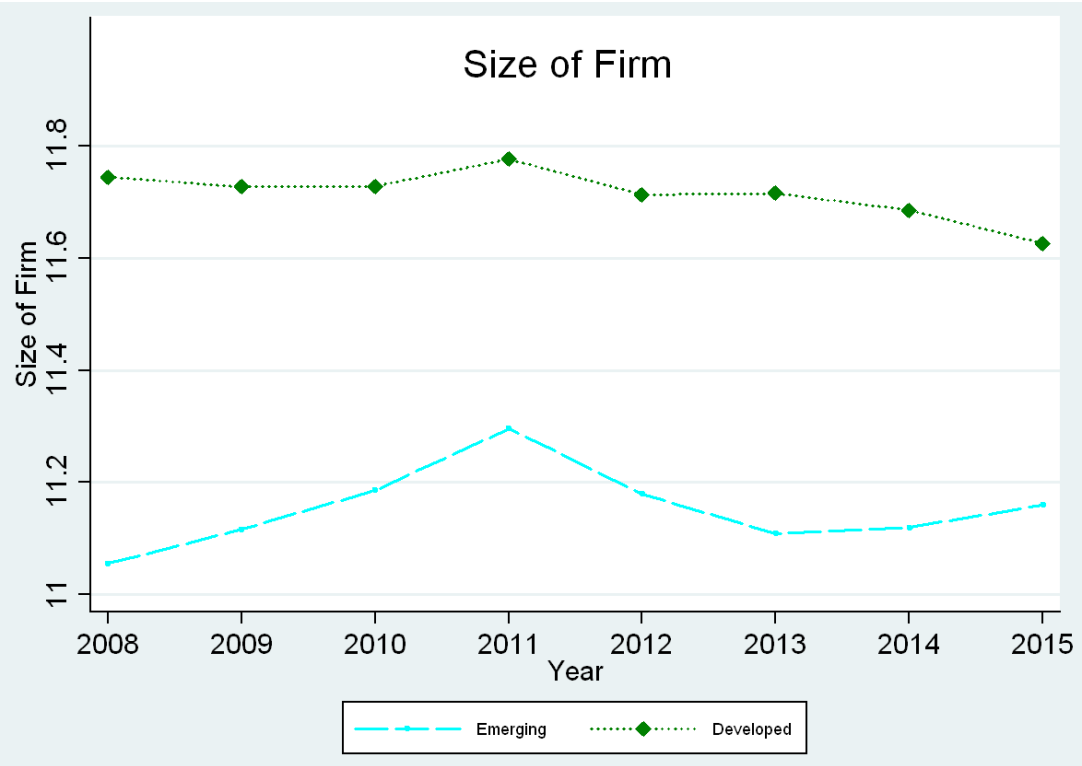

Figure 4 Size of Firm of Emerging and Developed
Source: Own authorship based on the information from the Global Financial Development Database by Čihák, Demirgüç-Kunt, Feyen and Levine

Table C – Variable´s correlations

	Stock Return	Risk Premium	SMB	HML	GDP growth	Real Interest rate	Capital Control	Openness	Depth	Access	Efficiency	Stability	Liquidity
Stock Return	1												
Risk Premium	0,1334	1											
SMB	-0,1105	0,0208	1										
HML	-0,2092	-0,2164	0,0875	1									
GDP growth	-0,1071	0,016	0,141	-0,0845									
Real Interest rate	0,0022	-0,0887	-0,1175	0,0351	-0,0422	1							
Capital Control	0,0835	0,1958	0,151	-0,0869	0,7061	0,0614	1						
Openness	-0,0012	0,0298	-0,2164	0,0436	0,1619	-0,0278	-0,0024	1					
Depth	-0,0597	-0,0213	-0,0577	-0,0823	-0,2723	-0,0874	-0,4494	0,5142	1				
Access	0,0851	0,2425	0,3344	-0,1187	0,2099	-0,2125	0,3134	-0,0347	0,0269	1			
Efficiency	0,1751	0,2868	0,3004	-0,3211	0,1525	-0,0623	0,2293	-0,1927	-0,1774	0,4664	1		
Stability	0,2642	-0,2805	-0,1308	-0,0924	-0,0339	0,0893	0,0913	-0,072	-0,2069	0,1244	0,2697	1	
Liquidity	0,0022	-0,0527	0,0799	-0,3225	-0,1878	-0,202	-0,2799	-0,0173	0,3439	0,1123	0,3567	-0,171	1

This table displays the correlations between the Fama and French three factors (Risk premium, SMB, HML), the macroeconomic variables (GDP growth, Real interest rate, Capital control, Openness and liquidity) and the financial development variables (depth, access, efficiency, stability).