Effect of U.S. Macroeconomic News Surprises on Emerging Stock Markets
A Case Study of three Latin American Countries

ABSTRACT
The purpose of this research is to examine the effects of U.S. macroeconomic news announcements on three emerging stock markets in Latin America. Incorporating news surprises on a large and new dataset of 253 macroeconomic announcements for the period between January 1990 to January 2011, this study focused on four types of macroeconomic variables: CPI, PPI, NFP, UNEMP. The results of this research indicate that U.S. macroeconomic news announcements do not have a significant effect on the emerging stock markets in Argentina, Chile and Mexico.
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Chapter 1  Introduction

Various media report everyday that stock prices are sensitive to the announcement of macroeconomic news. Following these reports, analysts try to explain these fluctuations of the stock market, attributing these movements to unanticipated or surprise announcements to companies, governments or banks. However, contradictory arguments are sometimes puzzling and complex for the outside observer. Since the United States of America’s economy (from here: U.S. economy) has a prominent role in the world, it can be expected that these unanticipated announcements are not only affecting the domestic economy. Previous research shows that macroeconomic news in the U.S. directly affects different stock markets in the world, and especially the emerging economies (e.g., Kim, 2003; Becker, Finnerty and Friedman, 1995).

This study will focus on obtaining more insight on the price of U.S. macroeconomic news in the emerging stock markets. The next paragraph indicates the problem of this research, with a formulated problem statement. After that, the research design, data collection and the structure of this thesis are explained.

1.1  Problem indication

Several papers investigated the risk of economic variables on the stock market (e.g., Shanken and Weinstein, 2006; Chen, Roll and Ross, 1986). These researchers explained that several macroeconomic variables affect stock markets systematically. Besides that, these variables influence asset prices, because they depend highly on their exposure to the state economy. Asset prices are expected to react to macroeconomic news, both anticipated as unanticipated. Unanticipated news, also known as unexpected news or news surprises is the difference between the market expectation and the actual rate.

The relations and effects of news on stock markets have been researched in many different studies. Thereby, most studies in this field focus on the U.S. stock market and a few developed markets. The countries’
economic conditions and risks might result in a downfall of investment opportunities available worldwide (Flannery and Protopapadakis, 2002), but especially in emerging countries. If macroeconomic news is announced in emerging countries, stock markets notice an effect with large stock price movements (Albuquerque and Vega, 2007). Measuring both the anticipated and the unanticipated news is an essential component to determine how asset prices will react to changes in news.

Therefore, the objective of this paper is to research the various effects of U.S. macroeconomic news on returns of emerging stock markets. Investigating the news changes of this world economy is of interest for this study, with a direct focus on emerging economies. Emerging economies are highly depending on the U.S. market, and are for foreigners very attractive as an investment opportunity (Hanousek and Kocenda, 2011).

This paper analyzes U.S. news in the emerging stock markets of Argentina, Chile and Mexico. They are listed in top-5 of highest GDP (per capita) in Latin America (IMF, 2011). These markets have shown a big growth potential, presence of strong relations with the U.S. and they experience large investor trade volumes with the U.S.. Moreover, this research provides a benchmark between different regions in Latin America and shows on which stock market news has the largest effect. Therefore, they provide valuable data to relate the cross-country variation of U.S. news on their markets.

For this study, the problem statement is formulated as follows:

**How does a change in U.S. macroeconomic news affect the returns on the emerging stock markets in Argentina, Chile and Mexico?**

This study measures this change by gathering market data of returns on stock. This problem statement will be answered with the help of a regression analysis. The effect of macroeconomic news on the returns of these three emerging stock markets is measured.
Research questions

- Do U.S. news announcements have a significant impact on the returns in emerging stock markets?
- Do emerging stock markets react differently to U.S. macroeconomic news announcements?
- Which U.S. macroeconomic variables have the largest impact on the returns in the emerging stock markets?

This study contributes to the current literature by giving support to the relationship between U.S. macroeconomic news and the price of the returns of the emerging stock market. The reaction of emerging stock markets is an important issue and topic in daily worldwide news. It is crucial to measure the effects of systematic risk factors on the asset prices and the stock market returns in these markets. Investors benefit from more insight in this phenomenon, responding better to moving stock prices. A comprehensive model, including unanticipated changes, gives them more guidance about the likely impact and the additional risks associated with that particular investment. Multinationals and policy makers also gain by obtaining essential data about the impact of news announcements, to assess (risky) investment portfolios, especially when the developments of asset prices are important for their policymaking. Moreover, this study uses a large dataset that captures both expectations and actual results of U.S. news, and conducts an empirical research into the impact on three emerging stock markets in Latin America.

Considering that, this research relates information in different directions on the risk factors associated with macroeconomic news announcements and has therefore both academic and practical relevance.

1.2 Research design

This study is an empirical research attempting to clarify the relationship between U.S. macroeconomic news and the price of the returns of the emerging stock markets in Argentina, Chile and Mexico.
For simplicity, this study focused only on four types of macroeconomic variables: Consumer Price Index (CPI), Producer Price Index (PPI), Non-Farm Payroll (NFP) and Unemployment Rate (UNEMP).

The methodology follows the same approach as Funke and Matsuda (2006) closely, because this study allows itself to be used as a comparison for the empirical results of this thesis. However, this study takes only four macroeconomic variables into account and does not calculate the domestic effect of news announcements. Despite that, the sample period is larger (twenty-one years) and three different countries are included in the sample.

1.3 Data collection

Our sample includes the returns of the three emerging stock markets Argentina, Chile and Mexico and data of the U.S. macroeconomic news announcements. Within this research, the sample period is 21 years: January 1st, 1990 to January 15th, 2011. For this empirical study, the macroeconomic variables are provided by Money Market Services International (MMS) and the Bloomberg database. Furthermore, the Thomson Reuters Datastream database is used to gather market data of returns on stock markets in Argentina (MERVAL-index), Chile (SSE-index) and Mexico (IPC-index). Although previous research attempted to analyze several local stock exchanges, this study distinguishes in the way that it analyzes three emerging stock markets in Latin America with an extended sample period.

1.4 Thesis structure

The structure of the thesis is as follows; Chapter two contributes with an extensive literature review and background, which form the basis of the research questions of this study. Chapter three describes the data collection of this study, which means the used data and the research design is explained. Chapter four presents the methodology of this research, followed by a discussion of the empirical results in chapter five. Finally, this research (chapter six) closes with a conclusion, and recommendations for further research.
Chapter 2 Literature review

The following section concentrates on relating theory to news announcements on stock markets. This phenomenon of news announcements comes along with changed stock prices. First, the efficient market hypothesis is explored, as it forms the economic basis for this research. Second, the relation between macroeconomic news and the stock market is discussed. Lastly, the contributions of this study compared to other literature are examined. The relationship between these concepts is entirely built by existing literature.

2.1 Efficient market hypothesis

Decades ago, economists generally argued that efficient capital markets existed (Fama, 1970). The efficient market hypothesis states that security markets are very efficient, and the stock prices are reflecting available information about the stock market and individual stocks (Malkiel, 2003). This also indicates that new information is incorporated in security prices as soon as the new information is released and spread. Investors do not have an advantage in predicting stock market returns, because they have the same information as everyone else. Shleifer (2000) contradicts the theory’s argument that “even the best managers are not able to outsmart the market”. He states that free markets are inefficient, because bets against mispricing (arbitrage) are perceived as risky.

Ormos and Vázsonyi (2011) use Fama’s definition to distinguish three degrees of market efficiency. Firstly, the weak form efficiency, which states that all historical information and prices are reflected in the stock prices. Secondly, semi-strong form claims that the current information and prices reflect all public information available. Thirdly, the strong form argues that both private and public (historical) information is reflected in the stock prices. However, since this study analyzes macroeconomic news, only the semi-strong form of market efficiency is used.
Other various hypotheses (with contradictory results) have been provided about the time if investors acquire private information. Kim and Verrecchia explain their hypotheses within two different models. Their first model (1991) assumes that investors obtained private information before the announcement takes place, and they are able to use this appropriately. The unanticipated part of the private information caused the price change directly after the news announcement. In their second model (1994), they assume that investors cannot obtain private information, which causes return volatility after the news is announced (Figure 1). In line with the first model, Ederington and Lee (1996) assume that investors acquire private information before the announcement, but it does not remove all uncertainty. It remains difficult to estimate how the stock market reacts to the news announcement. This is consistent with the return volatility of the market, emphasized as well by Nikkinen, Omran, Sahlström and Äijö (2006).

Figure 1: Difference between unexpected news and differential opinions (Kim and Verrecchia, 1994)

To conclude, this study assumes the market to be fully efficient, so it is in line with the hypothesis of market efficiency. The stock prices reflect all available information about the stock market in this study. Thus, only unanticipated news can change the return of the stock prices. This stimulates investors to adjust their stock portfolio accordingly.
2.2 Impact of macroeconomic ‘surprises’ on stock market

An important part of research in economics is concerned with the price of stock markets. Many different models help to determine the prices of assets, for example the capital asset pricing models (CAPM) and the arbitrage pricing theory (APT) (Shanken et al., 2006). In all these models, the link between expected returns and systematic risk is explained. Chen et al. (1986) explored asset pricing relative to macroeconomic variables. They were the first to suggest that economic news has a direct impact on the stock market.

Furthermore, a number of studies focused only on news announcements in the U.S. and assessed which types of announcements have a significant impact on stock markets (McQueen and Roley, 1993; Ederington and Lee, 1993, 1996; Li and Hu, 1998; Fleming and Remolona, 1999; Nikkinen and Sahlström, 2001). These papers concluded that the variables Producer Price Index (PPI), Consumer Price Index (CPI) and Employment Report (ER) (e.g. Non-Farm Payroll (NFP) and Unemployment Rate (UNEMP)) impacted the prices of the stock market.

In a different study, McQueen and Roley (1993) also reexamine the relationship between macroeconomic news announcements and the prices of stock. This incorporates news about several variables and business conditions, such as inflation and unemployment rate. The moment that the news is announced affects the volatilities and the return on the assets.

Funke and Matsuda (2006) conducted a study of U.S. news announcements on the stock market in Germany. They reported that news from the U.S. directly influenced the German stock prices. However, the German announcements themselves had even more impact, but the domestic impact is not included in the scope for this study. Albuquerque and Vega (2009) conducted the same research for the Portuguese market and found similar results. Nikkinen and Sahlström (2001) analyzed volatility around the date the news is announced for the Finnish market and measured changing stock prices. Much research focused on the impact on the stock market of capital markets in U.S. and/or the Europe. Therefore, this research scoped a different, emerging region with strong links (foreign investment, trade) to the U.S. market.
Various studies have related investment volumes per country to the state of the economy, and analyze the business conditions (e.g. Boyd, Hu and Jagannathan, 2005). Schwert (1981) assumed the response of investors was equally along the different cycle of the business. However, McQueen and Roley (1993) pointed out that this is not always true. They provided evidence that stock market response highly depends on the state of the economy. Particularly, positive news announcement lead to decreasing stock prices when there is a strong economy, but in a weak economy the same positive news announcement causes increasing stock prices. In line with this finding, Boyd et al. (2005) found a similar result with a different variable when conducting a research focused on news about unemployment. They analyzed that if unemployment is expected to rise during expansions, it is good news for stock prices. But when unemployment is expected to fall, stock prices will be lower. On the other hand, during economic contractions this phenomenon shows the opposite. Beber and Brandt (2010) criticized the research of Boyd et al. (2010) by arguing that this research does not distinguish between the effect of good news or bad news. They argued that macroeconomic news are important when it gives bad news for returns during an expansion, and good news during contradictions. A recent study by De Goeij, Hu and Werker (2010) conducted a research estimating the priced risk factors of macroeconomic announcements. They concluded that risk prices or news announcements are not equal over the various stages of the business cycle.

Therefore, the state of economy is an important extension for this research. The impact of U.S. news on stock prices is evident, but it can be in conflicting ways. This conclusion is consistent with Funke and Matsuda (2006), who argue that the value of unanticipated news announcement depend highly on the fact it is during an expansion or contradiction of the economy.

One of the most relevant studies for this research is written by Nikkinen et al. (2006). This study focused on the effects of several global stocks (in all main regions around the world) to U.S. news announcements. Their sample included market indices of 35 countries, and formed three different groups of emerging markets. This study concluded that many regions are affected by
the announcement of U.S. news, but the Latin American countries were not affected at all. In contrast, they also found evidence that the results to emerging countries in Asia are significant, which means that the tested macroeconomic variables have an effect on the uncertainty of the stock market. Their argument for this interesting difference in emerging countries is that Latin American markets are less integrated stock markets. An earlier study (Rockinger and Urga, 2001) concluded that there is less market integration among the emerging stock markets in contrast with the developed markets. Markets are less integrated if they depend less on international trade, which can be the case for these Latin American countries. Low investment opportunities might be another possible reason for this result. However, a major limitation to this research is that the sample period is limited to almost seven years and only ten U.S. macroeconomic announcements are taken into consideration. Besides that, this study analyzed the behavior of stock market volatilities.

To conclude, the effect of macroeconomic news announcements on the stock market is confirmed in many different studies. However, this study extends literature by using different variables and using a large dataset of twenty-one years. Moreover, it includes expectations on macroeconomic variables into this research. Lastly, globalization limited the gap between developed and emerging markets (Hanousek and Kocenda, 2011). The three countries in this scope of research have grown enormously in the past years (three large Latin American countries in terms of GDP) and foreign investment which makes it relevant to re-investigate.
Chapter 3  Data

This section focuses on the data used in this research. Our sample includes returns of the stock markets in Argentina, Chile and Mexico. Besides that, data of U.S. macroeconomic announcements are included in this research, both expectations and the actual returns. The sample period for this research is January 1, 1990 to January 15, 2011.

Previous studies analyzed the impact of macroeconomic variables on the stock market by using other sources to derive the surprise element of news. For example, Li and Hu (1998) and McQueen and Roley (1993) derived their data gathered from Money Market Services International (MMS International). Graham et al. (2003) and Ederington and Lee (1993) used data of market expectations from the Business Week and Wall Street Journal. Another approach is to derive the news data from the error terms in regressions (Boyd et al., 2005).

Table 1: Selected Macroeconomic Indicators

<table>
<thead>
<tr>
<th>MACROECONOMIC VARIABLES</th>
<th>UNIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONSUMER PRICE INDEX (CPI)</td>
<td>PERCENTAGE CHANGE (Δ%)</td>
</tr>
<tr>
<td>PRODUCER PRICE INDEX (PPI)</td>
<td>PERCENTAGE CHANGE (Δ%)</td>
</tr>
<tr>
<td>NONFARM ROLL PAYMENT (NFP)</td>
<td>THOUSANDS</td>
</tr>
<tr>
<td>UNEMPLOYMENT RATE (UNEMP)</td>
<td>PERCENTAGE CHANGE (Δ%)</td>
</tr>
</tbody>
</table>

(source: MMS&Bloomberg)

This study conducts analysis news to research the impact on the Argentinean, Chilean and Mexican stock indices. The macroeconomic data used consists of both expectations and actual results of four macroeconomic variables (Table 1) provided by Money Market Services International (MMS) and the Bloomberg database. MMS forecast and announcements (median forecast, actual released numbers, and exact release times) are used for the period January 1990 to September 2004, and data from Bloomberg are obtained from January 1997 to January 2011. The MMS macroeconomic
forecast series is discontinued after December 2004. These variables are measured from the median of data forecast and the actual announcements from both databases, using MMS from January 1990 to September 2004, and Bloomberg from October 2004 to January 2011. Within this respect, this dataset contains exact information about the date, time and the content of the news from the period January 1990 to January 2011.

This research considers only four variables (CPI, PPI, NFP, UNEMP) to show an impact on the stock market indices. These U.S. macroeconomic variables have shown their importance in earlier studies (e.g. Graham et al., 2003; Nikkinen and Sahlström, 2001). Moreover, they state that these macroeconomic variables are the largest influencing news announcements.

Consumer Price Index (CPI) and Producer Price Index (PPI) are important measures of inflation. If inflation falls, the amount of money the consumer spends rises significantly, which has a positive effect on the returns of the (foreign) stock market. The Non-Farm Payroll (NFP) is an important variable in identifying inflation or growth and establishing the unemployment situation. If the value of the NFP is increasing, it indicates economic growth, and vice versa. A drop in the Unemployment rate (UNEMP) has a positive effect on the (foreign) stock market. On the contrary, during economic recessions, less demand, companies recruitment fewer staff which results in a higher unemployment rate with negative effects for the stock market. This research takes all four macroeconomic indicators, since they have proven in previous studies to be important, into consideration.

Table 2: Emerging stock markets & availability date

<table>
<thead>
<tr>
<th>COUNTRY</th>
<th>STOCK MARKET INDICES</th>
<th>AVAILABILITY DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARGENTINA</td>
<td>MERCADO DE VALORES (MERVAL)</td>
<td>01-01-1990</td>
</tr>
<tr>
<td>CHILE</td>
<td>BOLSA DE COMERCIO DE SANTIAGO (SSE)</td>
<td>01-01-1990</td>
</tr>
<tr>
<td>MEXICO</td>
<td>INDICE DE PRECIOS Y COTIZACIONES (IPC)</td>
<td>01-01-1990</td>
</tr>
</tbody>
</table>

(source: Thomson Reuters Datastream)

Stock market returns are gathered from the Thomson Reuters Datastream database. This dataset consist of daily returns of the three
emerging stock markets in Argentina, Chile and Mexico from the period January 1, 1990 to January 15, 2011. This research uses daily returns of the stock market, since it is essential to relate the exact moment of releasing macroeconomic news to the daily change in stock markets. The different indices (Table 2, previous page) are selected based on their common availability of stock market data for the sample period, and their importance in the Latin American economy. To analyze whether the impact of U.S. macroeconomic varies across different countries, these countries are analyzed separately.
Chapter 4  Methodology

This section describes the methodology used in this research. The statistical analysis of this study consists of a time-series regression analysis. The regression used in this research is the Ordinary least squares (OLS), which is the most optimal estimation method assuming homoskedasticity. This section explains three different formulas and calculations which are made in order to optimize the dataset.

4.1 Measure of surprise

The change in the data of the stock prices is calculated. This is an important step before this dataset measures the effect of news announcement on the emerging stock markets. Because the stock markets differ in size, numbers and composition, this research calculates the change between the stock price at the end of the day, to the closing stock price of the previous day.

\[ R_{t+1} = \log \frac{S_{t+1}}{S_t} = \log S_{t+1} - \log S_t \]  

This equation (1) calculates the change of the stock price index. \((R)\) represents the change in the stock price index and \((S)\) is the stock price index. To be more precise, the returns of the stock market are calculated in the logarithm of the price index at the end of the day \((t+1)\), compared with one day earlier from the dataset \((t)\), multiplied by 100.

Within this study, both the expectations and actual results of the news announcements are taken into account, which is the surprise component of news. The data are employed to find evidence if the actual news announcement is different than the expected announcement of news. Following the approach of Balduzzi, Elton and Green (2001), a simple formula (benchmark model) constructs this difference to use standardized news announcements:
This equation (2) allows comparison of the different macroeconomic variables. In this equation, \((N_{k,t})\) are the news announcements of four macroeconomic variables. \((A_{k,t})\) is the actual number of the statistic announcement news released in \((k)\) at date \((t)\). This actual value subtracts \(E_{k,t}\), which are the expectations of the announcement, or the median survey forecast. On the bottom line of the equation, \((\sigma_k)\) is the calculated standard deviation of this formula To sum up, the difference between the actual news and the expectations is standardized in this research, which allows to make a comparison of the four announcements types. These announcement types are released at various dates, but they also contain different information. This allows this research to measure how significant the impact of these changes is on the stock markets.

4.2 The regression equation

This research uses the Ordinary-least squares regression in SPSS statistical software. The OLS-method is the regression method which minimizes the error term. Assuming homoskedasticity this is the optimal regression model for this research. Moreover, this regression is the most straightforward and common linear model analysis used in different studies. Furthermore, SPSS is one of the most commonly used software applications employed.

The effect of five macroeconomic variables on the stock markets in Argentina, Chile and Mexico is calculated with a regression equation. This model incorporates all four variables and the three different stock markets in one regression. The regression equation employed for this analysis calculates the return on the three stock markets \((R)\):

\[
R_{i,t} = \alpha_{i,k} + \beta_{i,k} N_{k,i,t} + \varepsilon_{i,t}
\]  

(3)
This equation (3) is essential to answer the main questions in this research. \( R_{t,i} \) measures the return on the stock markets, with the constant \( \alpha \) on a given time for all stock markets in this research. The four macroeconomic variables \( k \) of the standardized news announcement \( N \) in this equation are discussed in the previous chapter. The beta \( \beta \) measures how strong each variables is influenced by the criteria \( i, k \) of the regression.

For the Latin American Stock market the three indices: MERVAL (ARG), SSC (CHI), and IPC (MEX) are used as dependent variables in this research. Since the Latin American countries have the same time zone as the U.S. announcements, this research does not adjust for differences in time.
Chapter 5  Empirical analysis

This chapter discusses the results of the regression analysis. First, the summary statistics are provided and explained, followed by a graphical analysis of the returns on the stock market. This section is followed by the table which shows the estimation of the OLS-regression. The unbiased expectation hypothesis is discussed afterwards. Furthermore, the effect of news on stock market returns is presented together with a discussion of the results.

5.1  Summary statistics

Table 3: Descriptive characteristics of stock market returns statistics

<table>
<thead>
<tr>
<th></th>
<th>ARGENTINA (ARG)</th>
<th>CHILE (CHI)</th>
<th>MEXICO (MEX)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Last N</td>
<td>January 2011</td>
<td>January 2011</td>
<td>January 2011</td>
</tr>
<tr>
<td>Frequency</td>
<td>Monthly</td>
<td>Monthly</td>
<td>Monthly</td>
</tr>
<tr>
<td>N</td>
<td>5489</td>
<td>5489</td>
<td>5489</td>
</tr>
<tr>
<td>Min (in %)</td>
<td>-53.10</td>
<td>-4.89</td>
<td>-13.34</td>
</tr>
<tr>
<td>Max (in %)</td>
<td>29.94</td>
<td>9.48</td>
<td>12.92</td>
</tr>
<tr>
<td>Mean (µ)</td>
<td>0.1231</td>
<td>.0656</td>
<td>.0946</td>
</tr>
<tr>
<td>StDev</td>
<td>2.80372</td>
<td>.80899</td>
<td>1.58046</td>
</tr>
</tbody>
</table>

Note: The numbers are calculated *after* the percentage change (%∆) is calculated from the price index.
* N = number of data points entered (number of observations)

Table 4: Descriptive characteristics of macroeconomic news variable statistics

<table>
<thead>
<tr>
<th></th>
<th>CONSUMER PRICE INDEX (CPI)</th>
<th>PRODUCER PRICE INDEX (PPI)</th>
<th>NON-FARM PAYROLL (NFP)</th>
<th>UNEMPLOYMENT (UNEMP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Units</td>
<td>% change (%∆)</td>
<td>% change (%∆)</td>
<td>Thousands</td>
<td>% change (%∆)</td>
</tr>
<tr>
<td>Frequency</td>
<td>Monthly</td>
<td>Monthly</td>
<td>Monthly</td>
<td>Monthly</td>
</tr>
<tr>
<td>N</td>
<td>253</td>
<td>253</td>
<td>253</td>
<td>253</td>
</tr>
<tr>
<td>Min</td>
<td>-.40</td>
<td>-1.30</td>
<td>-328.00</td>
<td>-.40</td>
</tr>
<tr>
<td>Max</td>
<td>.40</td>
<td>1.70</td>
<td>408.50</td>
<td>.40</td>
</tr>
<tr>
<td>Mean (µ)</td>
<td>-.0097</td>
<td>-.01339</td>
<td>-19.2787</td>
<td>-.0275</td>
</tr>
<tr>
<td>StDev</td>
<td>.13279</td>
<td>.42428</td>
<td>104.45702</td>
<td>.14822</td>
</tr>
</tbody>
</table>

Note: The numbers are calculated *before* the surprise announcements (actual-median forecast) are standardized in this research, otherwise the StDev would equal 1.
*N = number of data points entered (number of observations)
5.2 Graphical analysis

In order to get an impression of the evolution of the stock indices, the volatility of the stock market is shown in Figure 2. The volatility might give an indication for the results of this research. The numbers showed in the graph are the percentage change of the returns (not multiplied by 100) over the whole sample period (January 1990 – January 2011).

Figure 2: Graphical analysis of returns on stock markets

The three stock indices show a high volatile percentage change during the sample period. For instance, the graph shows volatility clustering, which
indicates that relative small changes are followed with small changes. This also holds for large changes in the graph; these large changes tend to be followed by another large change. Besides that, the volatility in the graph is mean reversion, because the volatility does not remain constant, but revert back to the mean. This implies that high (or low) stock prices are mostly temporary phenomena, because it moves back to the average over time.

The Argentinean index shows the largest volatility among the three stock markets with a minimum change of -53.10% and a maximum change of 29.94%, while the Chilean index shows the smallest volatility among these three markets (Table 3). The mean is for all countries a positive number, which indicates economic growth during the period of the sample. For example, Argentina shows the highest growth number with a mean ($\mu$) of 0.1231. It consists of 5,489 data points or daily observations of the stock market returns during the sample period.

5.3 Effect of news on stock market returns

Table 5: Macroeconomic news and daily returns on the stock market

<table>
<thead>
<tr>
<th>k</th>
<th>i</th>
<th>$\alpha$</th>
<th>$\beta$</th>
<th>$R^2$</th>
<th>F-statistics</th>
<th>T-statistics</th>
<th>P-value $^*$</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPI</td>
<td>ARG</td>
<td>0.132</td>
<td>-0.051</td>
<td>0.000</td>
<td>0.054</td>
<td>-0.315</td>
<td>0.753</td>
</tr>
<tr>
<td></td>
<td>CHI</td>
<td>0.136</td>
<td>-0.015</td>
<td>0.001</td>
<td>0.075</td>
<td>-0.335</td>
<td>0.751</td>
</tr>
<tr>
<td></td>
<td>MEX</td>
<td>0.096</td>
<td>-0.097</td>
<td>0.04</td>
<td>0.517</td>
<td>-0.974</td>
<td>0.971</td>
</tr>
<tr>
<td>PPI</td>
<td>ARG</td>
<td>0.037</td>
<td>-0.026</td>
<td>0.000</td>
<td>0.021</td>
<td>-0.166</td>
<td>0.868</td>
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<tr>
<td></td>
<td>CHI</td>
<td>0.066</td>
<td>-0.042</td>
<td>0.025</td>
<td>3.174</td>
<td>-0.774</td>
<td>0.440</td>
</tr>
<tr>
<td></td>
<td>MEX</td>
<td>0.048</td>
<td>-0.064</td>
<td>0.002</td>
<td>0.259</td>
<td>-0.719</td>
<td>0.473</td>
</tr>
<tr>
<td>NFP</td>
<td>ARG</td>
<td>0.073</td>
<td>-0.205</td>
<td>0.008</td>
<td>2.076</td>
<td>-1.441</td>
<td>0.151</td>
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<tr>
<td></td>
<td>CHI</td>
<td>0.154</td>
<td>0.005</td>
<td>0.000</td>
<td>0.010</td>
<td>0.101</td>
<td>0.919</td>
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<tr>
<td></td>
<td>MEX</td>
<td>0.172</td>
<td>-0.106</td>
<td>0.005</td>
<td>1.341</td>
<td>-1.158</td>
<td>0.248</td>
</tr>
<tr>
<td>UNEMP</td>
<td>ARG</td>
<td>0.092</td>
<td>-0.103</td>
<td>0.002</td>
<td>0.521</td>
<td>-0.722</td>
<td>0.471</td>
</tr>
<tr>
<td></td>
<td>CHI</td>
<td>0.141</td>
<td>-0.062</td>
<td>0.005</td>
<td>1.335</td>
<td>-1.155</td>
<td>0.249</td>
</tr>
<tr>
<td></td>
<td>MEX</td>
<td>0.185</td>
<td>-0.038</td>
<td>0.001</td>
<td>0.171</td>
<td>-0.413</td>
<td>0.680</td>
</tr>
</tbody>
</table>

$X = ***$ Significant if p-value $\leq 0.01$ | $**$ Significant if p-value $\leq 0.05$ | $*$ Significant if p-value $\leq 0.10$
Notes: The dependent variable is calculated by the change of the returns on the stock market. The four independent variables are calculated by every surprise part of the news announcement (in percentage changes), subtracted by the median forecast. This number is divided by the standard deviation. This table includes the whole sample, from January 1, 1990 to January 15, 2011, for all variables. The constant (\( \alpha \)) describes the value of the DV. The beta (\( \beta \)) measures how strong each variables is influenced by the criteria. \( R^2 \) is the proportion of variance explained by the predictors.

5.4 Unbiased Expectations Hypothesis

Following the Efficient Market Hypothesis, only macroeconomic news has an impact on stock prices. Therefore, this study incorporates that news expectations are unbiased. Table 4 enumerates some characteristics of macroeconomic news. It shows the minimum, maximum and the mean (\( \mu \)) of news, based on the four chosen variables. Furthermore, the last two columns of Table 5 states the test results, the t-statistic and the p-value (marginal significance level), which null hypothesis is that the mean equals zero versus a two-sided alternative hypothesis that the mean does not equal zero. The null hypothesis (value of the sample mean equals zero) will be rejected, only if the p-value is lower than 0.05 and the research is 95% sure to reject the null-hypothesis.

The outcome of this table is that for all four variables, the null-hypothesis cannot be rejected in this research (p-value \( \geq 0.05 \)). The fact that the news announcements are expected to be equal to zero is rejected. This indicates that news expectations are unbiased in this research.

5.5 Results

This study will analyze the statistical and economical significance of the findings in two different perspectives, namely based on the macroeconomic perspective and based on the cross-country perspective. From a cross-country perspective, there is not a marginal difference between the countries in the sample. The stock markets in Argentina, Chile and Mexico show insignificant results for the effect of the macroeconomic variables CPI, PPI, NFP and UNEMP show insignificant results.

Table 5 provides the results of estimating the regression analysis (equation 3) on stock market returns in three different countries. The overwhelming evidence in the table is that none of the variables is statistically significant in this research (p-value \( \geq 0.05 \); t-statistic \( \geq 1.96 \)). This research
cannot reject the null-hypothesis and the results indicate that U.S. macroeconomic news does not have a clear effect on the stock markets of Argentina, Chile and Mexico. Moreover, the F-test shows that the model is insignificant, which indicates that the variation cannot be explained for these countries or macroeconomic variables. Furthermore, the low beta-values (absolute value of the number) indicate that the variables are not strongly influenced by the criteria in this research, because the closer the beta-value equals 1 or minus 1, the larger the magnitude of the impact increases. However, some beta-values provide interesting results. Firstly, the NPF beta-value of Chile is the only positive number, which means that a NPF announcement has a positive effect on the stock market index in Chile. Secondly, the other beta-values enhance a negative effect on an announcement, which indicate that an CPI announcement in the U.S. enhanced negative effects on the stock market indices. Thirdly, the NPF beta-value of Argentina shows the largest (negative) effect on the stock market. This difference in countries could be a result of their development in international trade.

This result supports the previous findings, such as Nikkinen et al. (2006). They found that some emerging regions around the world (Asian economies) are affected by U.S. macroeconomic news announcements, while others (Latin American economies) are not. Gümüş et al. (2011) also conducted the same research and obtained insignificant results from the effect of U.S. news on the Turkish (emerging) stock market.

5.6 Discussion

In contrary to this research, many studies did find significant results for the effect of macroeconomic variables on the stock market (e.g. Fleming and Remolona, 1999; Nikkinen and Sahlström, 2001). However, these studies used a different sample of regions or countries to obtain significant results. The outcome of this research could indicate that not many persons in Latin America follow the U.S. news announcements closely and use this information and process it in the stock prices, otherwise the effect should have been more significant.
Nikkinen et al. (2006) attempted to find reasons for this insignificant result. Their main argument is that these emerging countries are segmented markets, where market integration with the U.S. news announcements is low. Previous research in the field of market integration concluded the same (Bekart and Harvey, 1995; Rockinger and Urga, 2001). These studies emphasize the low-dependence of the segmented markets on the world economy, more specifically on international trade. Besides that, the market infrastructure could differ from highly-integrated markets, which results in less opportunities to integrate in the world market. Firms or investors could choose to select low-risk investments (often low-returns) in these countries, or strive to obtain diversification benefits (Bekaert and Harvey, 1995).

Another reason for this insignificant result could be that this research did not distinguish the announcement of news in different states of economy, which is researched by Beber and Brandt (2010). They examined the effect of good and bad news during both expansions and contradictions in the business cycle, and found some important results that macroeconomic variables have various effects, depending on the state of the economy. The type of news could also be a reason for this insignificant result, since macroeconomic news consists out of only one single type of news (macroeconomic) (Funke and Matsuda, 2006). For example, organization specific news or political news could have a different effect on stock markets. Moreover, this reasoning holds in case this news does not affect the international stock market, but only the local stock market. If domestic events or news announcements have a large impact on their own market, U.S. news could have a slight effect on the country’s stock market.

To sum up, markets are generally considered to have become more open and integrated to the world market. This is caused by the increase of foreign investment opportunities and the growth numbers of the emerging economies. However, a country’s policy, investment restrictions and government regulations could be examples which result in segmented markets, depending less on the U.S. market. Emerging countries could be less integrated than expected, which result in not significant results, as is the case for Argentina, Chile and Mexico in this research.
Chapter 6 Conclusion

The goal of this research is to measure if there is an effect of U.S. macroeconomic news announcements on the emerging stock markets in Argentina, Chile and Mexico. Using the OLS-regression analysis, this research measures the effect of four macroeconomic variables, namely Consumer Price Index (CPI), Producer Price Index (PPI), Non-Farm Payroll (NFP) and the Unemployment Rate (UNEMP). This final chapter provides a conclusion and recommendations for further research are addressed.

6.1 Conclusion

By deepening insight in the impact of macroeconomic variables on the price of stock, this research examines the U.S. news effects on emerging stock markets, in a theoretical and empirical way.

This study is in line with the hypothesis of market efficiency, which states that the stock prices reflect all available information about the stock market. Thus, only unanticipated news can change the return of the stock prices. A number of studies focused only on news announcements in the U.S. and assessed which types of announcements have a significant impact on stock markets, namely CPI, PPI, NFP, and UNEMP. Other studies analyze the business conditions and take the state of economy into account.

The final conclusion of this research is that U.S. macroeconomic news announcements do not have a significant effect on the emerging stock markets in Argentina, Chile and Mexico. All four variables showed insignificant test results, which indicates that U.S. macroeconomic news does not affect these Latin American countries.

In general, several studies suggest as an answer to the research question that U.S. news announcements do affect the returns of the stock market. Moreover, the chosen macroeconomic variables proved their importance for the effect on the stock market. But within this research, this suggestion is not proved for low-integrated emerging economies. These segmented markets depend less on the world market than expected, which results in insignificant outcomes for this research.
Nevertheless, this study supports previous findings about emerging stock markets. For instance, Nikkinen et al. (2006) conducted similar results when testing the same emerging stock markets.

### 6.2 Recommendations for further research

This research has several extensions to the analysis presented above, which were out of the scope of this research. First, business conditions of the economy could provide a more profound perspective on the main question of this research. The results could differ significantly if the sample period distinguishes economic expansions and recessions, and the content of the news: good vs. bad news. Second, different types of news could be included in the research. Measuring not only for macroeconomic news, but also for political, or company specific news leads to a different, more extended/balanced effect on the emerging stock market. Third, examining the impact of domestic news announcements (next to the U.S. news announcement is also a valuable angle, which could lead to significant results for segmented, emerging economies. Fourth, the volatility of the emerging stock markets is another interesting extension for this research. By using the GARCH-model the effect of news announcements on the volatility of the stock market could be examined.

As these recommendations show, this research does not provide a final conclusion about how U.S. macroeconomic news affects the stock markets in Argentina, Chile and Mexico.
Effect of U.S. Macroeconomic News Surprises on Emerging Stock Markets

Reference list


