

**MASTER
FINANCE**

MASTER'S FINAL WORK
DISSERTATION

THE IMPACT OF THE ECONOMIC INTEGRATION IN THE EUROPEAN
UNION ON INITIAL PUBLIC OFFERING ACTIVITY

FABIAN SCHMITZ

OCTOBER -2019

MASTER FINANCE

MASTER'S FINAL WORK DISSERTATION

THE IMPACT OF THE ECONOMIC INTEGRATION IN THE EUROPEAN
UNION ON INITIAL PUBLIC OFFERING ACTIVITY

FABIAN SCHMITZ

SUPERVISION:
MARIA TERESA MEDEIROS GARCIA

OCTOBER - 2019

GLOSSARY

CMEA – Council of Mutual Economic Assistance

DiD – Differences-in-Differences approach

EEC – European Economic Community

EFTA – European Free Trade Organization

EI – Economic Integration

EMS – European Monetary System

EMU – European Monetary Union

EU – European Union

EURATOM – European Atomic Energy Community

FDI – Foreign Direct Investment

GDP – Gross Domestic Product.

IPO – Initial Public Offering

ITS – Interrupted Time Series

MLM – Mixed Linear Model / Multi Linear Model

OEEC – Organization for European Economic Cooperation

SEA – Single European Act

ABSTRACT, KEYWORDS AND JEL CODES

The Impact of Economic Integration has been studied on a number of topics. Its impact on Initial Public Offering activity, however, was not yet subject to research. Theory of Economic Integration suggests that Economic Integration might impact IPO activity in a positive nature. This dissertation aims to study this relationship based on Economic Integration in the European Union. The analysis with Mixed Linear Models suggests that Economic Integration in the EU, in form of joining the union, has a positive impact on IPO activity. The impact of adopting the Common Currency and joining the Schengen-Area was not supported by the results.

KEYWORDS: Economic Integration; Initial Public Offerings; European Union.

JEL CODES: F15, B17.

TABLE OF CONTENTS

Glossary	i
Abstract, Keywords and JEL Codes	ii
Table of Contents.....	iii
List of Tables	v
Acknowledgments	vi
1. Introduction	1
2. Literature Review	2
3. Theory of Initial Public Offering Activity.....	3
3.1. Definition.....	3
3.2. Initial Public Offering Activity.....	3
4. Theory of Economic Integration.....	7
4.1. Definition.....	7
4.2. Factors of Economic Integration	8
4.3. Levels of Economic Integration	9
4.4. Effects of Economic Integration.....	11
5. Economic Integration in the European Union	12
6. Hypothesis Development.....	15
7. Data.....	17
7.1. Dependent Variable	17
7.2. Independent Variables	21
7.3. Control Variables.....	22
8. Methodology and Results	23
8.1. Methodology.....	23

8.2. Analysis One: EU-28.....	25
8.3. Analysis Two: Grouped EU-28	30
9. Discussion and Conclusion.....	32
References	34
Appendices	39

LIST OF TABLES

Table 1 – Descriptive Statistics – IPO Count	19
Table 2 – Correlation Matrix	26
Table 3 – Model 1: Covariance Effects	26
Table 4 – Model 1: Fixed Effects	26
Table 5 – Model 2: Covariance Effects	27
Table 6 – Model 2: Fixed Effects	27
Table 7 – Model 3: Covariance Effects	28
Table 8 – Model 3: Fixed Effects	28
Table 9 – Model 4: Covariance Effects	28
Table 10 – Model 4: Fixed Effects	29
Table 11 – Model 5: Covariance Effects	29
Table 12 – Model 5: Fixed Effects	30
Table 13 – Model 6: Fixed Effects	30
Table 14 – Model 7: Fixed Effects	31
Table 15 – Model 8: Fixed Effects	31
Table 16 – Model 9: Fixed Effects	31
Table 17 – Model 10: Fixed Effects	32
Table 18 – Data Comparison – Descriptive Statistics – Zephyr.....	39
Table 19 – Data Comparison – Descriptive Statistics – Thomson Reuters.....	40

ACKNOWLEDGMENTS

I would like to thank my supervising Professor Maria Teresa Medeiros Garcia for her encouragement and guidance.

Furthermore, I would like to thank my Family and Friends for all the support they have given me throughout my university career and beyond.

THE IMPACT OF THE ECONOMIC INTEGRATION IN THE EUROPEAN UNION ON INITIAL PUBLIC OFFERING ACTIVITY

By Fabian Schmitz

THIS DISSERTATION has the purpose to investigate the Impact of Economic Integration in the European Union on Initial Public Offering activity.

1. INTRODUCTION

Economic Integration has been one of the major guarantors of European economic and political success since the end of the Second World War. This Economic Integration is closely connected with Political Integration. Guided by the European Union, as well as by the Unions predecessor organizations, a gradual process of Economic Integration lead to the creation of a Common Market, and even a Common Currency. The impact that this development had on peace, political stability, and the abolishment of borders seems obvious. The European Union occupies consequently a major part in the life of its citizens. It is therefore of utmost importance, to assess the impact it has on other aspects. This dissertation will study the Impact of Economic Integration in the European Union on Initial Public Offerings. This has, to the best of my knowledge, not yet been done.

Economic Integration as it progressed, between severing States, is unprecedentedly strong in the European Union. The Union is therefore, besides its general relevance, an optimal object of study in respect to Economic Integration.

This dissertation will proceed as follows. First, a literature review on Initial Public Offering activity and on Economic Integration will examine the current state of study. After that, the theories of both fields will be elaborated on. This is followed by the provision of a European context to those theories. The Hypotheses to our research question will be developed subsequently based on the information gathered prior.

A description of the data and methodology will follow. The actual analysis will then be conducted using a Linear Mixed Model. The dissertation will end with a discussion and conclusion.

2. LITERATURE REVIEW

Initial Public Offering (IPO) activity has been subject to a great amount of research. Baxamusa & Jalal (2017) studied why IPOs occur in clusters or waves. Dicle & Levendis (2017) tested whether market volatility has an impact on IPO activity. Batnini & Hammami (2015) did the same in respect to stock market returns. Santos (2017) researched the relationship between IPO activity and sentiment-driven investors. Alti (2005) focuses on IPO activity related to a pioneer –follower relationship. Ibbotson & Jaffe (1975) dedicated their work to the ‘hot issue’ market, in respect to IPOs with high initial returns.

The impact of market conditions on IPO activity has been studied extensively. Boeh & Dunbar (2014), Pastor & Veronesi (2005), and Lowry & Schwert (2002) tested the impact of market conditions on IPO activity, while focusing on underpricing. Meluzin et al (2014) focused on the influence of macroeconomic factors.

The works of Plotnicki & Szyska (2014) and Colaco et al (2018) were also subject to the impact of market conditions, but focused on waiting tendencies in the IPO process of companies conducting IPOs. Colak & Günay (2010) investigated those waiting tendencies in regard to a pioneer – follower relationship.

Doidge et al (2011) looked at IPO activity in respect to laws and governance, while La Porta et al (1997) studied the relationship of IPO activity and investor protection, i.e. legal rules and law enforcement.

The Impact of Economic Integration has been studied in respect to cross-border venture capital investments in the European Union by Alhorr et al (2008). It also has been tested on the profitability of cross-border mergers and acquisitions by Bjorvatn (2004) and on the competitiveness of Czech regions by Litva (2017). Simionescu (2018) investigated the Impact of Economic Integration on migration within the European Union. Lane (2006) estimated the effects of the European Monetary Union on macroeconomic performance. Barrios et al (2003) focused on the Impact of Economic Integration on the regional business cycle.

The impact that Economic Integration has on foreign direct investment (FDI) has been subject of the works of Brenton et al (1999) and Motta & Norman (1996). It has been tested furthermore on the impact on economic growth by Edison et al (2002) and, with a

focus on East Asian Economic Integration, by Dee (2007). Paelinck & Polèse (1999) tested the Impact of Economic Integration on shifts in economic activity and political power.

3. THEORY OF INITIAL PUBLIC OFFERING ACTIVITY

3.1. Definition

Initial Public Offerings are a mechanism for prosperous companies to satisfy their capital needs. Companies do so by selling shares of the company's stock to the public. The first time this stock is offered, is called the Initial Public Offering. This mechanism creates therefore value for the company, but also a market for the stock. The process of conducting an IPO is also referred to as 'going public' (Newman et al, 1992).

In this study, Initial Public Offering activity is defined as the number of firms that are going public at a given point or period in time.

3.2. Initial Public Offering Activity

Initial Public Offerings are not evenly distributed over time (Ibbotson & Jaffe, 1975). They rather occur in cycles, also called waves or clusters, with periods of low and periods of high frequency of firms going public. IPO activity is described by the number of IPOs at any given time. This absolute number is also referred to, among other terms, as 'IPO volume' or 'IPO count'. In this work, the terms 'IPO count' and 'IPO activity' will be used.

Going public can be beneficial for companies. The process of going public, however, is also subject to costs. The existence of those benefits and costs influence the decision of companies in respect to if and when to offer stock to the public (Ali, 2012).

In this dissertation, it is assumed that the decision to go public and the subsequent decision of when to go public are highly correlated. Since the determinants that influence these decisions cannot be differentiated sufficiently, no differentiation between these two are made in this work. The following paragraphs will outline possible influential determinants.

Ali (2012) grouped regularly researched determinants for IPO activity in three

categories. These categories cover research that investigates whether IPO activity depends on, i) favorable business and economic conditions, ii) stock market conditions, and iii) decreasing adverse selection costs. This categorization can be extended by iv) the recent IPO market performance. The categories are used for structural purposes and are not fully separable from each other.

Favorable economic and business conditions describe the impact of the business cycle and the resulting investment opportunities on IPO activity. They suggest that during times of economic growth, i.e. during an upturn in the business cycle, investment opportunities for companies become more frequent and therewith the need to raise capital increases. Raising capital for investment needs and opportunities to fund expansion is a common incentive for going public. Favorable conditions may also decrease uncertainty in respect to future performance (Ali, 2012; Brau & Fawcett, 2006). Favorable economic and business conditions are commonly indicated by the rate of GDP growth (Meluzín et al ,2014).

Favorable economic and business conditions have a significant impact on the decision to go public (Ali, 2012; Brau & Fawcett, 2006; Colaco et al, 2018; Colak & Günay, 2011; Michailides, 2000). This correlation is of positive nature, i.e. the number of firms carrying out IPOs increases during an upturn of the business cycle, and decreases in the contrary situation (Michailides, 2000). The need to raise capital with an IPO to fund future growth is an influential determinant for IPO timing. It is followed by the need to capitalize on the company's good historical financial results (Brau & Fawcett, 2006; Plotnicki & Szyska, 2013).

Stock market conditions include the two independent factors of bull market timing and behavioral timing. Theory suggests that companies time offerings to achieve a high volume IPO, i.e. in terms of capital raised.

Bull market timing refers to an actual favorable stock market situation with high stock prices (Ali, 2012). Managers take advantage of a better stock market performance, attracting stock investors with high possible returns in the aftermarket. When the market is risky, however, companies try to avoid the chance of an unsuccessful IPO by remaining private (Brau & Fawcett, 2006; Pastor & Veronesi, 2005; Plotnicki & Szyska, 2014; Tran & Jeon, 2011). The positive change in stock prices, rather than the

stock prices themselves, is such an indicator (Pastor & Veronesi, 2005). Annual index returns, annual market and turnover growth (Meluzín et al, 2014), as well as the market level and the market run-up (Ali, 2012) and expected volatility (Dicle & Levendis, 2017) may also be indicators. Therefore, the number of IPOs is expected to increase when the stock market performs well and when investor sentiment is high.

There is evidence for a positive impact of stock market performance on IPOs activity. Stock market performance is a dominant factor in determining the timing of IPOs (Batnini & Hammami, 2015; Brau & Fawcett, 2006; Pastor & Veronesi, 2005; Plotnicki & Szyszka, 2014; Tran & Jeon, 2011). The two variables market level and the market run-up impact the number of IPOs at a certain time significantly (Ali, 2012). Low expected market volatility also effects IPO activity positively (Dicle & Levendis, 2017).

Behavioral timing, on the other hand, refers to periods of overly optimistic investor sentiment that result in overvaluations of stock prices (Ali, 2012). Overvaluation requires retail investors that are expecting a high aftermarket demand. Firms take advantage of this overvaluation by offering the stock above fundamental value (Santos, 2017). Therefore, more capital is being raised from IPOs when investors are more optimistic. Because of this, changes in investor sentiment, even if not based on actual favorable conditions, are expected to impact equity issuance activity (Michailides, 2000).

There is evidence for the impact of investor sentiment on IPO activity. Ali (2012), Michailides (2000), and Santos (2017) have proven that taking advantage of overvaluation in the market is a major determinant of IPO activity. There is also evidence against its impact. Colak & Günay (2011) conclude that market overvaluation does not influence IPO activity significantly.

The impact of adverse selection costs suggest, that firms are more likely to go public when there is only a low level of information asymmetry between issuer and investor. Adverse selection costs are indirect costs that arise due to this asymmetric distribution of information. Firms pay these costs in form of offer mispricing, the so-called underpricing. They represent a major part of the costs involved in IPOs. An IPO is therefore cheaper when information asymmetry is minimized (Ali, 2012; Altı, 2005). Consequently, the number of IPOs is expected to increase during periods of low information asymmetry, i.e. when the proceeds of an IPO exceed the costs (Baxamusa

& Jalal, 2018).

There is evidence for the impact of adverse selection costs on IPO timing provided by Ali (2012), Alti (2005), and Colaco et al (2018). Evidence against its impact was found by Michailides (2000).

The recent IPO Market refers to a pioneer – follower relationship for firms going public. It suggests that based on a successful IPO of a pioneer company, a number of companies follow by going public as well. It works under the condition, that certain variables of recent IPOs contain information on the market valuation of the future (Lowry & Schwert, 2002).

It follows the logic that information gathered based on the pioneer IPO leads to less uncertainty about the economic and market conditions. This lowers adverse section costs, and leads to an increasing number of follower firms going public (Alti, 2005; Colak & Günay, 2011). This category is closely related to all three categories above.

The impact IPO Market performance on the timing of IPOs is not uniformly agreed upon. There is evidence against its impact given by Brau & Fawcett (2006) and Ibbotson & Jaffe (1975). Evidence in support of its impact is given by Boeh & Dunbar (2014), Colak & Günay (2011), and Lowry & Schwert (2002). Latter also conclude that mainly firms of similar type, i.e. from the same industry, are involved in IPO timing clusters.

There are non-economical influences on IPO activity. IPO activity is influenced by countries laws and its enforcement. Common law countries show a higher amount of firms going public than countries with bodies of law of different origin. Activity depends also on the quality of national institutions (Colaco et al 2018; Doidge et al, 2011), Due to the scope of this dissertation, non-economic aspects will be largely left out of the analysis.

Summarizing, economic and business conditions are proven to be influential on IPO activity. Literature generally agrees on the impact of stock market conditions on IPO timing, whereas the evidence for bull market timing is strong and the evidence for behavioral timing given, but by fewer works. The same applies to adverse selection costs and the recent IPO market.

4. THEORY OF ECONOMIC INTEGRATION

4.1. Definition

In order to investigate its impact on Initial Public Offering activity, it is necessary to define the term ‘Economic Integration’. Definitions of the term vary. Therefore, three definitions will serve as an orientation.

In his work on the theory of Economic Integration, Balassa (1962) identifies two varieties of the term, i.e. a process and a state. He defines the term based on this separation.

“Regarded as a process, it encompasses measures designed to abolish discrimination between economic units belonging to different national states; viewed as a state of affairs, it can be represented by the absence of various forms of discrimination between national economies.”

In: Balassa (1962), p. 1.

He further distinguishes between Economic Integration and Economic Cooperation. The objective of Economic Cooperation is therefore to lessen trade discrimination; the objective of Economic Integration is to abolish it.

El-Agraa (1989) also separates of Economic Integration into a state of affairs and a process.

“[These forms involve] the amalgamation of separate economies into larger regions [...]. More specifically, International Economic Integration is concerned with the discriminatory removal of all trade impediments between the participating nations and with the establishment of certain elements of cooperation and coordination between them.”

In: El-Agraa (1989), p. 1

Molle (1990) defines Economic Integration in a similar, but more elaborative, way. He follows the same separation as Balassa and El-Agraa, but is referring to the process as dynamic, and to the state as static. He defines Economic Integration as:

“[A] gradual elimination of economic frontiers between countries. The usual stages are distinguished. At the first stage, goods traffic among partners is liberalized. This stage is followed by the liberalization of movement of production factors. Coordination of the national policies, with regard to

economic sectors but also to such aspects as exchange rates, is the objective at the third stage.[...]. Used in a dynamic sense, it indicates the gradual elimination of economic frontiers among member states (that is to say, the abolition of national discrimination), with the formerly separate national economic entities gradually merging into a larger whole. [...]. Used in a static sense, 'Economic Integration' represents a situation in which the national components of a larger economy are no longer separated by economic frontiers but function together as an entity."

In: Molle (1990), p. 9.

In this dissertation, Economic Integration is understood as a process, as defined by Balassa (1962), El-Agraa (1989), and Molle (1990). It will, however, not follow the stage concept mentioned by Molle, nor the distinction of Economic Integration and Economic Cooperation made by Balassa. It is therefore defined in a broader sense. This definition is well suited, since this study focuses on Economic Integration in the European Union, which is indeed still in process and not yet finalized. A deeper understanding of Economic Integration in the European Union is given in the following chapters.

Additionally to the definition made, it should be mentioned that International Economic Integration may be of positive and negative nature. 'Negative integration' refers to the partial removal or complete abolishment of trade barriers between participating countries in order to achieve a higher degree of trade liberalization. 'Positive integration' refers to the establishment or modification of institutions or policy to govern the new integrating markets and promote its further integration by harmonizing rules across countries (El-Agraa, 1989). Negative integration requires positive integration (Molle, 1990)

4.2. Factors of Economic Integration

Economic Integration is best explained by the convergence of four factors between the integrating markets. The free movement of Goods and Services are the main factors of Economic Integration. The free movement of production factors, i.e. Labor and Capital, are the other two factors. In an imperfect market, certain production factors may be available in surplus in one place, but missing in another. Thus, the

market is not functioning to its fullest economical potential. More efficiency can be achieved by the optimal allocation of these production factors (Molle, 1990). The convergence of these factors leads to an increased similarity of the integrating countries (Alhorr et al, 2008).

Good markets are fully integrated when the market allows free trade among member states. Goods can be traded between participating countries like within one individual country, without any restrictions.

Service markets are fully integrated when producers and consumers of a service can provide or consume services freely across borders. Due to often substantial transaction costs for trading services over longer distances, economies of scale are limited, but are increasing due to technological progress.

Free movement of the production factor Labor, allows free movement of people within the market. That is, citizens of member countries can take employment, or practice self-employment in any of the other member countries without being subject to any restrictions.

The movement of the production factor Capital is considered to be free, if one is able to invest ones capital, or satisfy ones needs for capital anywhere and without any restrictions, cross-border, within the participating countries. Capital is then able to move freely to areas where it can be used most effectively (Molle, 1990).

4.3. Levels of Economic Integration

Economic Integration is guided by, and dependent on, political will and policy. Economies integrate therefore not abruptly, but gradually. One can identify a number of levels of Economic Integration. Those levels are not stages, i.e. actual steps of the integration process that are to be followed, but rather show the intensity of Economic Integration as static categorizations of a gradual process (El-Agraa, 1989). The levels describe mechanisms that promote the convergence of the four factors Goods, Services, Labor, and Capital, as defined in the previous chapter. The mechanisms range from eliminating tariffs to creating Common Markets or Common Currencies (Alhorr et al, 2008).

The following levels may be identified, with increasing intensity of Economic Integration, as a Free-Trade Area, a Customs Union, a Common Market, an Economic Union, a Monetary Union, an Economic and Monetary Union, and a Full Economic Union (Molle, 1990).

- In a Free-Trade Area, trading barriers, e.g. tariffs, are abolished between the participating countries. There are, however, no common regulations applied to third countries. Each participating country determines its own third party regulations, i.e. with countries outside of the free trade area.
- The Customs Union resolves this issue, by the union setting up common trade regulations in respect to third party countries.
- The Common Market is an extension of the Customs Union, also allowing the four production factors Goods, Services, Capital and Labor, to move freely within the unions' market.
- An Economic Union augments this by the member states pursuing common economic and monetary policies, market regulations, and income redistribution.
- A Monetary Union can be viewed separately to the Common Market and the other levels. Within the union, fixed exchange rates between currencies are set up or a common currency is created.
- The Economic and Monetary Union is a combination of the Economic Union and the Monetary Union.
- A Full Economic Union is the level with the highest degree of Economic Integration. At this level, all the participating economies are fully integrated, and merged into one. In such a single market, the same rules apply to all participating economies. Market participants from one union country cannot be prevented from operating in one another (Molle, 1990; El-Agraa, 1989).

All levels abolish, to different degrees and as an internal goal, any discriminative measures between the participating economies. As an external goal, the participants may create or uphold common discrimination against third party economies (Molle, 1990).

4.4. Effects of Economic Integration

Economic Integration is, as stated by Molle (1990), “not an objective in itself; its rationale is to serve higher objectives, both on an economic and of a political nature.” Objectives may be the improvement of economic welfare, peace and security, democracy, or human rights (Molle, 1990). The increase in welfare can be considered the ultimate objective of economic activity (Balassa, 1962).

Even though most examples of Economic Integration were established or pursued for primarily political reasons, gains in economic welfare is a dominant argument used in favor of further Economic Integration (El-Agraa, 1989). To further pursue the research question of this work, the effects of Economic Integration on the economy, especially on its contribution to welfare, will be in focus.

As shown in the literature review, the Impact of Economic Integration has been studied on various topics. The tested relationships are not relevant for the investigation of our research question. Thus, in this chapter, the effects of Economic Integration will be based on theory, rather than on quantitative studies. Including the varying results of these studies would exceed the scope of this dissertation. Examples of how this theory may translate to the Economic Integration in the European Union will be given when the Hypotheses are being developed.

The effects of Economic Integration on the economy and on welfare may be explained by the convergence of the four factors, and by the scale of the market.

The convergence of the Good and Service markets leads to an optimal allocation of the two production factors Labor and Capital. In particular, as mentioned above, the free movement of Labor makes it possible to allocate specific qualities and quantities of the labor force (individuals) to the right form of employment. The free movement of Capital allows individuals to invest freely anywhere within the integrating market in the way best suited for their needs (Molle, 1990). Efficiency is reached though “labor mobility from capital-poor to capital-rich regions (migration) [and] capital mobility from capital-rich to capital-poor regions (investment)” (Burda & Hunt, 2001).

The optimal allocation of the production factors increases the specialization of each country in the Good and Service for which they have a comparative advantage. This

specialization makes resource allocation more effective. It therefore enhances efficiency (El-Agraa, 1989; Molle, 1990).

Integrating markets provide firms with an increase in market size and in competitors. This results in fewer and larger firms, thus, economies of scale. Lower average cost, due to both aspects, lead to improved efficiency of production and lower prices (Baldwin, 2006; El-Agraa, 1989; Molle, 1990). Price reduction is additionally promoted through the elimination of tariffs (Baxamusa & Jalal, 2018). Moreover, the increase in market size leads to increasing leverage for international ‘terms of trade’ (El-Agraa, 1989). All of which is welfare enhancing.

It can be concluded, that Economic Integration leads, through the optimal allocation of production factors and through economies of scale, to a more efficient usage of economic resources. This increase in efficiency results in more production and lower costs, consequently, enhanced welfare. Effects, however, may differ based on the intensity levels of Economic Integration.

5. ECONOMIC INTEGRATION IN THE EUROPEAN UNION

Economic Integration is closely related to Political Integration. In order to put the theory of Economic Integration and IPO activity in context with the case of Economic Integration in the European Union, this chapter provides the historical development of Political and Economic Integration in the EU. It is important to understand this political development, since the mechanisms of Economic Integration in the EU were established gradually alongside it. The historical context also provides the basis to identify the events that will serve as signals for this dissertations analysis of Economic Integration in the EU.

As laid out in the following paragraphs, Economic Integration in the European Union, and its predecessor organizations, and between its member states was and still is a gradual process. The higher the intensity of Economic Integration, the more it is required to transfer authority from the national level to the union level (Molle, 1990).

Following the Second World War, Europe was politically and ideologically divided. This led to very little Economic Integration between the countries of the eastern and the western bloc.

- In 1948, the Organization for European Economic Cooperation (OEEC) was formed to promote Economic Integration between the western and central European member countries. The organization did so by liberalizing trade through the removal of restrictions. A similar organization, the Council of Mutual Economic Assistance (CMEA), was founded by European countries belonging to the soviet bloc. The establishment of the OEEC indicates an end to a period of nationalism and protectionism.
- In 1950, Germany, France, Belgium, Luxembourg, the Netherlands, and Italy formed the European Coal and Steel Community (ECSC) to put those two important economic sectors under the supervision of one common high authority.
- In 1957, two more supranational organizations, the European Economic Community (EEC) and the European Atomic Energy Community (EURATOM) were founded by the same six countries through the Treaties of Rome. While the ECSC and EURATOM were focused on Economic Integration in very specific sectors, the EEC Treaty was subject to the entire economy (Molle, 1990). The Treaty set up a Customs Union, which removed all internal tariffs and established common external tariffs to third party countries. It also established the free movement of the two production factors Labor and Capital. It therefore deepened Economic Integration immensely.
- In 1965, all three organizations, the ECSC, the EEC, and EURATOM merged into the European Community (EC). The objective of the European Community was to establish a Customs Union, realize a Common Market, and an Economic Union (Molle, 1990).
- In 1960, some European countries, but non EEC members, i.e. Denmark, Ireland, and the United Kingdom, founded the European Free Trade Association (EFTA).

- In 1973, Denmark, Ireland, and the United Kingdom joined the ECC. Other remaining EFTA countries pursued Economic Integration with the ECC through bilateral Free Trade Agreements (FTAs).
- In 1979, The European Monetary System (EMS) was established. Its purpose was to stabilize the exchange rates between the many EEC currencies. Member states had to follow a monetary policy to keep their respective exchange rates within certain boundaries to a central EMS exchange rate.
- In 1981, Greece joined the ECC, with Portugal and Spain following in 1986.
- In 1986, the Single European Act (SEA), a set of changes to the Treaties of Rome, came into effect. The Act was meant to foster European Economic Integration. Central changes concerned the liberalization of the good trade (elimination of border formalities, VAT harmonization) and the liberalization of factor trade (removal of capital controls, increasing capital market integration, liberalization of cross-border market-entry policies).
- In the early 1990s, with the political East-West division in Europe coming to an end, and Germany reuniting, many central eastern European countries ratified bilateral association agreements with the European Community throughout the first half of the decade.
- In November 1993, the Maastricht Treaty led to the establishment of an Economic and Monetary Union (EMU) and a Political Union. There are three pillars to the Treaty, concerning Economic Cooperation, foreign policy and security, as well as judicial and internal matters. The Treaty formally established the European Union. It led to the establishment of the European Central Bank (ECB) in 1999 and the adoption of the Euro by some EU members in 2002.
- In 1995, the Schengen Agreement got implemented in seven EU countries. The Schengen-Area entitles EU citizens to free movement within the Union, without special formalities. Also in 1995, Austria, Sweden, and Finland joined the EU.
- In 1999 and 2003, respectively, the Treaties of Amsterdam and Nice came into effect as an update the Maastricht Treaty.
- In 2004, the Union expanded by the following 10 countries: Cyprus, Czechia, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia, and Slovenia.
- In 2007, Bulgaria and Romania joined the EU.

- In 2009, the Treaty of Lisbon was signed. It served as an update to the Maastricht Treaty to modernize the Union.
- In 2013, Croatia joined the Union.

Sources: Baldwin (2006); European Union (2019); European Commission (2019) Molle (1990); Damsgaard (2001)

6. HYPOTHESIS DEVELOPMENT

The Impact of Economic Integration on Initial Public Offering Activity has not yet been tested. This dissertation will pursue to study its impact by using evidence from the European Union.

The definition and the theory of Economic Integration show, that Economic Integration can be described by the convergence of the four factors Goods, Services, Capital, and Labor. This convergence is the result of the elimination of trade barriers between the integrating markets. It happens gradually and with different levels of intensity. The theory also suggests that Economic Integration leads to more efficient markets and therefore growth and an increase in welfare.

The choice of conducting an Initial Public Offering is dependent on favorable economic and business conditions, which can be indicated by exactly that increase in welfare, measured by GDP growth. It is also dependent on stock market conditions. The level of adverse selection costs and recent IPO success also show evidence of having an influence.

Economic Integration therefore affects determinants of IPO activity. This is particularly true for Economic and Business conditions. Based on this connection it is assumed, that Economic Integration has an influence on IPO activity. This influence can be of direct or indirect nature. The assumption is going to be tested based on evidence from the European Union.

For the sake of structuring the gradual process of Economic Integration, levels of intensity of Economic Integration were established. In order to test the impact that Economic Integration in the European Union has on IPO activity, it is necessary to identify certain significant events in European Economic Integration that serve as

signals for the independent variables used in the model. The intensity levels and the historical development will help to identify these events.

European Political Integration is not separable from European Economic Integration. The history of Economic Integration in the European Union and its predecessor organizations gives several opportunities to identify dates that may be used. Those moments are well described by a treaty coming into effect.

Since 31 individual countries are subject of this study, for which Economic Integration progressed at different rates, the signals must meet a number of requirements. First, for the sake of comparability, we need a signal that all or many of the union countries participated in. Second, they should represent the highest levels of integration intensity reached in the European Union.

Based on the Theory of Economic Integration and the historical background given, one can identify joining the EU and joining the Schengen-Area as two signals. The adoption of the Common Currency, the Euro, can be identified as another signal. It is necessary to test for more than one event, since not all EU countries have participated or completed all three. Furthermore, it resembles the complexity of the Economic Integration process.

Becoming an EU member, as well as joining the Schengen-Area, are each useful signals. On the scale of intensity, the European Union represents a mix of the Common Market and Economic Union levels. A Common Market allows the free movement of the factors Goods, Services, Labor and Capital. Tariffs and other barriers of trade are abolished between the integrating markets. These 'four freedoms' were established through both, membership in the EU and the Schengen-Area. Adopting the common currency, the Euro, represents the intensity level of the Monetary Union.

These events are particularly beneficial to use as signals, because they are well comparable over all 28 EU countries. The effect of joining the EU can be measured on all EU countries. The effects of adopting the Euro and joining the Schengen-Area can each be tested on the majority of EU countries. Furthermore, for the sake of developing a model and collecting appropriate data, it is helpful that these events happened within the last 22 years for all union countries. It started with the creation of the European

Union through the Maastricht treaty in 1993, and ended, for the time being, with the adoption of the Euro by Lithuania in 2014 (European Union, 2019).

Based on the information gathered above, an increase in IPO activity can be expected, following the three events chosen.

- Hypothesis 1: Economic Integration in the European Union, identified by a country joining the European Union, leads to a significant increase in IPO activity in that country.
- Hypothesis 2: Economic Integration in the European Union, identified by a country adopting the Euro as its currency, leads to a significant increase in IPO activity in that country.
- Hypothesis 3: Economic Integration in the European Union, identified by a country joining the Schengen-Area, leads to a significant increase in IPO activity in that country.

7. DATA

The data used in this dissertation originates from a number of databases. Data was collected from Thomson Reuters, Moody's Zephyr, the World Bank, and several statistic sections of different Stock exchanges. As explained above, the model will rely on data for the time period January 1st, 1989 to December 31st, 2018. Raw Data, when first collected, mostly exceeded this time period.

The model will be run on all 28 European Union member countries, as well as on the three EFTA members Norway, Switzerland, and Iceland. Therefore, data was collected for all these subjects.

7.1. Dependent Variable

Data on the dependent variable, IPO count, has been collected from the ThomsonOne (Thomson Reuters) database. A list of all IPOs of all of the above mentioned countries has been extracted on August 25th, 2019. This was done by using the Screening & Analysis function in the Deals & League Tables module.

The initial list showed all IPOs with issuing date from January 1st, 1985 to August 24th, 2019. Only IPOs that were flagged as ‘live’ were selected, which guarantees that no transactions are included for which the IPO process is not yet completed. The Data set included 9.617 IPOs. After scanning the data for duplicates, and subsequently dropping 2.284 observations, the dataset included 7.333 individual IPOs. Duplicates originated mostly due to the fact that some stock was offered in several tranches, which were recorded separately. We do not differentiate between domestic and foreign offerings, but use the total number. IPOs from dependencies of EU countries, but that are not themselves EU members, were not included.

After deciding on the timeframe used for analysis, all observations before October 1st, 1988 and after July 31st, 2019 were dropped. The number of IPOs in the data set was reduced by 102 to 7.231 IPOs. This was done, so all full quarters in the time period could be used for analysis.

Due to a change in method, an analysis with yearly observations was decided on. Therefore, observations from the ‘incomplete’ years, i.e. 1988 and 2019, were dropped. This reduced the list by 69 to 7.162 IPOs.

Since the focus of this analysis does not lie on individual IPOs, but on its absolute number per country-year, the data set was summarized using a pivot table. Table 1 summarizes all 7.162 observations in a matrix of 31 countries over the time span of 30 years, i.e. 930 country-years.

An IPO count of zero IPOs per year is a frequent observation in the panel dataset. The minimum count per country however, ranges from 0 to 7 IPOs. The maximum IPO count per country ranges from 1 to 274 IPOs. Average IPOs per year in a country range from 0.03 IPOs to 84.80 IPOs. Consequently, the total number of IPOs over the entire timeframe differs greatly; from 1 to 2544 (Table 1).

Table 1

Descriptive Statistics - IPO Count

	Austria	Belgium	Bulgaria	Croatia	Cyprus	Czechia	Denmark	Estonia	Finland	France	Germany	Greece	Hungary	Iceland	Ireland	Italy	Latvia
N	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
Valid	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Missing	2,83	4,60	,73	,30	,77	,37	4,47	,33	4,10	32,67	24,17	7,33	1,13	,13	3,43	12,93	,20
Mean	12	17	9	5	5	2	16	4	20	115	146	47	5	1	12	38	2
Range	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	1	0
Minimum	12	17	9	5	5	2	16	4	20	116	147	47	5	1	12	39	2
Maximum	85	138	22	9	23	11	134	10	123	980	725	220	34	4	103	388	6

Descriptive Statistics - IPO Count

	Lithuania	Luxembourg	Malta	Netherlands	Norway	Poland	Portugal	Romania	Slovakia	Slovenia	Spain	Sweden	Switzerland	United Kingdom	Total
N	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
Valid	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Missing	,47	1,93	,20	6,10	8,27	13,33	1,37	,50	,03	,10	4,77	11,30	5,07	84,80	238,73
Mean	4	6	1	22	28	76	6	3	1	1	15	51	17	267	710
Range	0	0	0	0	0	0	0	0	0	0	0	0	0	7	34
Minimum	4	6	1	22	28	76	6	3	1	1	15	51	17	274	744
Maximum	14	58	6	183	248	400	41	15	1	3	143	339	152	2544	7162

The outcome of the analysis relies not only on the model chosen, but also of the reliability of the data that is used. In order to make sure that the data used is sufficiently accurate, and provides a true resemblance of the reality, we aim to test our data by comparing it to other sources.

For the scope of the data needed, i.e. 31 countries over 30 years, the data set extracted from ThomsonOne proved to be the most complete data set found. It has also been used by Doidge (2013) in a paper on worldwide IPO activity. Therefore, the data set will be used regardless of outcome of the comparison. Even if the data from sources deviate from each other, it will provide knowledge of the issue, and will help to adequately interpret the reliability of the results.

The comparative IPO data was extracted from Zephyr. The Zephyr database provides comprehensive information on IPOs and Merger and Acquisitions. However, the available data does not sufficiently cover the chosen time period. A list of all Initial Public Offerings was extracted on August 31st, 2019 for the same group of countries. The list included all 9.397 completed IPOs from January, 1st 1997 to August, 31st 2019. After eliminating 110 IPOs recorded after December 31st, 2018 and subsequently dropping 65 duplicates, the final data set included 9.222 IPOs.

The two data sets provide a comparable panel of 21 years and 31 countries. The recorded IPOs extracted from Zephyr are shown in Table 18, the ones from Thomson Reuters in Table 19.

For the comparable time frame, the Zephyr data set records about one third more IPOs than the Thomson Reuters data set. The total number of IPOs recorded per country, as well as the average number of IPOs per country, is higher in the Zephyr data set for 94% of the cases. The amount of country years that are not exactly matching within a Country ranges from 4.5% to 100%.

The absolute number of IPOs differs drastically between countries and years. In order to measure IPO activity in a more comparable way, the dependent variable was set in respect to the size of the countries' securities markets. This is done by setting a country's IPO count of each year in relation to the total number of listed companies in that country in the year prior.

The number of listed companies was extracted from the World Bank Statistics Portal for

the years 1988 to 2017. Missing data was collected manually from the respective Stock Exchange websites. Some values had to be estimated. This was done by using the median of the preceding and succeeding years. The number of listed companies for a year corresponds to the number of companies listed on December 31st. An examination of the data set through comparison was, due to the lack of alternative sources, not possible.

7.2. Independent Variables

Information on the adoption of EU membership, adoption of the Euro, and adoption of the Schengen-Area was retrieved from the website of the European Union on October 5th, 2019.

All three independent variables are identified by certain dates. Since we observe effects yearly, and these dates do not always fall on January 1st, events that happened in the first six month of the calendar year were allocated to be part of that year; events that happened in the second half are considered to be part the next year.

The adoption of EU Membership. This variable indicates the year a country joined the European Union. For the countries that were members of EU predecessor organizations, founding of the EU through the Maastricht Treaty will serve as the entry date. The adoption of EU membership is a dichotomous variable, where (0) indicates EU membership and (1) indicates no EU membership. The three EFTA countries are not EU members, and therefore the only countries in the panel that are coded as (1) over the entire time period.

The adoption of the Euro. This variable indicates whether and when a country adopted the Euro. It therefore indicates European Monetary Union membership. Not every country in the sample adopted the Common Currency. Thus, the variable is coded as a dichotomous variable, with (0) indicating membership of the European Monetary Union, (1) indicating non-membership.

The adoption of the Schengen-Area. This variable indicates whether and when a country joined the Schengen-Area. The three EFTA countries are officially not Schengen members, but are associated with the Schengen-Area based on agreements made between the Union and the respective country. The coming into effect of these

agreements will serve as the date for joining the Schengen area in this model. The variable is coded as a dichotomous variable, with (0) indicating membership of the Schengen-Area, (1) indicating non-membership.

7.3. Control Variables

Gross Domestic Product (GDP) Growth. As shown in chapter three, the wealth of a country has a significant impact on IPO activity. For that reason, GDP growth will serve as a control variable in the model. The GDP growth was extracted from the World Bank statistics portal on October 5th, 2019. For some years, data was missing. These values were left blank, since the chosen model does not require a fully balanced data set.

Former Political Regime. This variable indicates whether a country was formally communist or not. These include all countries formally affiliated with the Soviet Union and Yugoslavia. It therefore controls for possible influence of the different economic background. The former political regime is coded as a dichotomous variable, where (0) indicates that the country was formally under communist rule, and (1) indicates that the country has a capitalistic past.

EU predecessor membership. This variable controls possible effects for countries that were members of EU predecessor organizations. Since some countries were integrating with EU predecessor organizations, i.e. ECC, which was not taken into account in the independent variable of EU membership, this variable controls for this impact. Economic Integration through membership in predecessor organizations was happening in these countries before 1994; therefore, its impact after 1994 might be biased. It is coded as a dichotomous variable, where (1) includes the six founding countries and the six countries that joined before our time period starts, and (0) for countries that joined during the observation period. The information for this variable was taken from the website of the European Union.

8. METHODOLOGY AND RESULTS

8.1. Methodology

The analysis of the data collected for this study was done with the IBM SPSS statistic software.

The outcome of the analysis is dependent on the model used and the data collected. The data that makes up the foundation of this study was assembled in a panel data set, which includes data for 31 subjects, i.e. countries, over 30 years. In order to match the data structure and to adequately test the three hypotheses, the model has to meet the following conditions.

First, it has to be capable of analysing panel data. Second, it has to take account of the effects that three events, adoption of EU membership, adoption of the Euro, and adoption of the Schengen-Area have on the dependent variable. Third, it must do so with respect to the fact that these events happened at different times for the different countries. The observation period before and after an event happening is therefore different for many countries. Fourth, it has to function with the data types used; i.e. the transformed count data as a dependent variable, and dichotomous independent variables. The timing aspect is of particular importance, since the scope of fitting one model for each country (and for each event), and a subsequent comparison of results, would be out of scope for this study. The possibility of just looking at 5 years before, and 5 years after each event, and therefore dropping large amount of the data, was not an option. The reduction of the dataset would waste important information.

Literature offers several models that can be used for evaluating the impact of events or policy on a dependent variable. A study, that aims to explain such casual effects triggered by policy, is also referred to as an event study (Wooldridge, 2009). Following, a short overview of the models that were considered is given. The following paragraphs will not explain the models in detail, with all the respective benefits and shortcomings, but will rather give a quick overview of what is being used for similar studies.

A common method to event analysis is the Differences-in-Differences (DiD) approach. The analysis relies on two data sets. The first set contains the subjects of

interest in panel format, referred to as the treatment group. This group is affected by the event. The other data set contains data of comparable subjects, called the control group. This group is not affected by the event.

The method compares the changes of the dependent variable from pre- to post event in the treatment group, to the differences observed in the control group for the same time period. The Differences-in-Differences method works with panel data (Bertrand et al, 2004; Bello-Gomez et al, 2018). For this study, the approach did not seem to be practical. The need for an appropriate control group would complicate the data collection immensely. Besides that, the approach lacks the option to evaluate the impact of three events simultaneously. Moreover, the fact that the events vary in date per country, would lead to the drop of many observations.

The Interrupted Time Series (ITS) approach is applicable to events that are well defined by a date of occurrence. This clear definition of intervention is obligatory. The method separates the original time series in two parts, i.e. pre and post event. The pre event time series is used to establish an underlying trend to forecast the trend that would be expected in the post event time series. The forecasted expected trend, which was not subject to the treatment, is then compared to the actual post event trend. The impact is then deducted from that difference (Bernal et al, 2016; Hudson et al, 2019). The scope of the panel data set used in this study would not allow for use of the ITS approach. Since there are three events of interest at several dates, a multitude of ITS models would be necessary. A subsequent comparison of the result would be unpractical.

The Poisson Regression Model is well suited to investigate count data. Event counts are non-negative variables, which include the number of observed occurrences of an event for the subject of interest. This number is allocable to a fixed time frame like a year, a month, a minute, etc. (King, 1988; Wooldridge, 2009). Since the dependent variable of this study got transformed from count data to a ratio, the Poisson Regression Model was not an applicable option.

The model best suited for the data in this study, proved to be a Multilevel Mixed Linear Model (MLM). It accounts for the non-independence of the subjects. It is also capable of analysing the impact of all three events on all countries within one model. Moreover, MLM is capable of grouping subjects. We will take advantage of this feature.

The Multilevel Linear Model has the following form:

$$Y = \beta X + Zu + \varepsilon$$

where Y is the response vector group, βX is the fixed effects design matrix, Z is the random effect design matrix for u , and ε represents the vector of residuals (Bauer, 2003).

Therefore, the model used is the following:

$$Y_{ij} = \beta_0 + \sum_{p=1}^P \beta_{pj} X_{pj} + Zu + \varepsilon_{ij}$$

This model has been previously used in a related study by Alhorr et al. (2008), which estimated the impact of Economic Integration, measured by adoption of the Common Market and adoption of the Common Currency, on cross-border Venture capital investments in the EU.

The analysis in this dissertation is orientated on the procedure taken by Alhorr et al (2008). First, the model will be run only the control variables. After that, a mixed liner model will be run on each of the three independent variables, i.e. events. Finally, a complete model will be run, including all three effects. This will be done by using a panel of only the 28 EU countries.

This procedure is repeated in the second part on the analysis. This time, however, on the 28 EU countries grouped by EU joining date.

8.2. Analysis One: EU-28

In the first part of the analysis, five models were run. The analysis is based on the 28 individual EU countries. Model 1 includes only the control variables, while models 2 through 4 include the control variables, as well as one of the independent variables, respectively. Finally, model 5 will include all variables. This procedure allows to first estimate the impact of each variable by itself, and also to observe the combined effects.

Before running the models, one should observe the correlations between the variables used. Table 2 shows the correlations between all variables. The correlations are, with one exception, all significant at either the 0.01 or 0.05 levels. The correlation between EU membership and GDP growth are not significant.

Correlation Matrix

		IPO ratio	EU	Euro	Schengen	gdp growth	regime	predecessor
IPO ratio	Pearson Correlation	1	-,219**	-,112**	-,089**	,171**	,165**	-,162**
EU	Pearson Correlation	-,219**	1	,538**	,646**	,050	-,346**	,323**
Euro	Pearson Correlation	-,112**	,538**	1	,619**	,124**	-,399**	,351**
Schengen	Pearson Correlation	-,089**	,646**	,619**	1	,213**	-,285**	,322**
gdp growth	Pearson Correlation	,171**	,050	,124**	,213**	1	-,071*	,092**
regime	Pearson Correlation	,165**	-,346**	-,399**	-,285**	-,071*	1	-,697**
predecessor	Pearson Correlation	-,162**	,323**	,351**	,322**	,092**	-,697**	1

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Table 2

Model 1 was run only including the control variables of GDP growth, past economical regime, and EU predecessor membership. None of the chosen control variables have a significant impact on the dependent variable. The model results are shown in Table 4. Table 3 shows the significance of both AR(1) diagonal and AR(1) rho. The model shows a good fit (-2log L = -2724.54).

Estimates of Covariance Parameters^a

Parameter		Estimate	Std. Error	Wald Z	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Repeated Measures	AR1 diagonal	,001878	,000121	15,480	,000	,001655	,002131
	AR1 rho	,494603	,031009	15,950	,000	,431448	,552933

a. Dependent Variable: IPO ratio.

Table 3

Estimates of Fixed Effects^a

Parameter	Estimate	Std. Error	df	t	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
gdpgrowth	,000850	,000566	759,604	1,501	,134	-,000262	,001961
regime	,010070	,007310	128,930	1,378	,171	-,004393	,024533
predecessor	-,008763	,007026	128,583	-1,247	,215	-,022664	,005138

a. Dependent Variable: IPO ratio.

Table 4

Model 2 includes the independent variable EU membership, alongside the control variables. Table 5 shows the significance of both AR(1) diagonal and AR(1) rho. The model shows a good fit ($-2\log L = -2721.73$). The model results are shown in Table 6. The control variables remain non-significant. The impact of EU membership is significant, and the relationship is of positive nature ($\beta = 0.0175$, $p < 0.05$). This result supports Hypothesis 1; i.e. joining the EU has a positive impact on IPO activity.

Estimates of Covariance Parameters^a

Parameter		Estimate	Std. Error	Wald Z	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Repeated Measures	AR1 diagonal	,001845	,000118	15,579	,000	,001627	,002092
	AR1 rho	,484613	,031412	15,428	,000	,420691	,543746

a. Dependent Variable: IPO ratio.

Table 5

Estimates of Fixed Effects^a

Parameter	Estimate	Std. Error	df	t	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
[EU=0]	,017504	,007656	380,833	2,286	,023	,002450	,032557
gdpgrowth	,000927	,000565	755,841	1,641	,101	-,000182	,002036
regime	,005759	,007403	139,025	,778	,438	-,008877	,020396
predecessor	-,006288	,006966	133,218	-,903	,368	-,020066	,007490

a. Dependent Variable: IPO ratio.

Table 6

Table 8 shows the results of model 3, which was run containing the independent variable adoption of the Common Currency and the control variables. Model diagnostics are shown in Table 7. The model shows a good fit ($-2\log L = -2717.78$). All control variables are non-significant. The adoption of the Euro does also not show a significant impact on IPO activity in the EU ($\beta = 0.0080$, $p > 0.1$). The results do not support Hypothesis 2; i.e. adopting the common currency has a positive impact on IPO activity in the EU.

Estimates of Covariance Parameters^a

Parameter		Estimate	Std. Error	Wald Z	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Repeated Measures	AR1 diagonal	,001883	,000122	15,394	,000	,001658	,002138
	AR1 rho	,497019	,031109	15,977	,000	,433634	,555510

a. Dependent Variable: IPO ratio.

Table 7

Estimates of Fixed Effects^a

Parameter	Estimate	Std. Error	df	t	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
[EURO=0]	,007982	,006534	236,366	1,222	,223	-,004891	,020854
gdpgrowth	,000861	,000566	759,328	1,521	,129	-,000251	,001973
regime	,007440	,007649	134,211	,973	,332	-,007688	,022569
predecessor	-,007737	,007104	127,938	-1,089	,278	-,021794	,006320

a. Dependent Variable: IPO ratio.

Table 8

To test the impact of joining the Schengen-Area on the dependent variable, model 4 was run. It includes the independent variable of Schengen-Area membership and the control variables. The model diagnostics are shown in Table 9. The results of model 4 are shown in Table 10. The model shows a good fit (-2log L = -2716.98). Similar to model 3, are all control variables non-significant. The independent variable of joining the Schengen-Area shows no significant impact on the dependent variable (beta= 0.0055, $p > 0.1$). Thus, the model does not support Hypothesis 3; i.e. joining the Schengen-Area has a positive impact on IPO activity in the EU.

Estimates of Covariance Parameters^a

Parameter		Estimate	Std. Error	Wald Z	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Repeated Measures	AR1 diagonal	,001879	,000122	15,443	,000	,001655	,002134
	AR1 rho	,494907	,031061	15,934	,000	,431642	,553327

a. Dependent Variable: IPO ratio.

Table 9

Estimates of Fixed Effects^a

Parameter	Estimate	Std. Error	df	t	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
[Schengen=0]	,005472	,006241	236,327	,877	,382	-,006823	,017767
gdpgrowth	,000910	,000571	760,502	1,596	,111	-,000210	,002031
regime	,009261	,007373	129,506	1,256	,211	-,005326	,023848
predecessor	-,007556	,007164	131,294	-1,055	,294	-,021728	,006616

a. Dependent Variable: IPO ratio.

Table 10

Finally, model 5 includes all three independent variables, as well as the control variables. This way, the combined effects of the three independent variables can be studied. Model diagnostics are presented in Table 11. The model shows a good fit ($-2\log L = -2706.54$). In contrast to the first four models, GDP growth shows to be moderately significant ($\beta = 0.0010$, $p < 0.1$). The impact of the other two control variables remains non-significant. In respect to the independent variables, the combined model shows, as visualized in Table 12, consistency with models 1 through 4. EU membership remains a significant variable on IPO activity ($\beta = 0.1681$, $p < 0.05$), while the adoption of the Euro ($\beta = 0.006$, $p > 0.10$), and joining the Schengen-Area ($\beta = 0.0013$, $p > 0.10$) remain non-significant variables.

Estimates of Covariance Parameters^a

Parameter		Estimate	Std. Error	Wald Z	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Repeated Measures	AR1 diagonal	,001855	,000120	15,441	,000	,001634	,002106
	AR1 rho	,488487	,031544	15,486	,000	,424256	,547828

a. Dependent Variable: IPO ratio.

Table 11

Estimates of Fixed Effects^a

Parameter	Estimate	Std. Error	df	t	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
[EU=0]	,016805	,007815	414,769	2,150	,032	,001443	,032166
[EURO=0]	,006941	,006693	253,305	1,037	,301	-,006240	,020122
[Schengen=0]	,001253	,006510	274,031	,192	,848	-,011563	,014069
gdpgrowth	,000948	,000569	756,285	1,665	,096	-,000170	,002065
regime	,003460	,007735	141,369	,447	,655	-,011831	,018750
predecessor	-,005218	,007134	131,614	-,731	,466	-,019330	,008894

a. Dependent Variable: IPO ratio.

Table 12

8.3. Analysis Two: Grouped EU-28

The second part of this analysis will also include 5 models. The procedure is the same as in the first part of the analysis. This time, however, the countries will be grouped by the date they joined the EU. This can be done by making use of the hierarchical structure of mixed linear models.

The results for model 6 are shown in Table 13. Contrary to the non-grouped analysis, is GDP growth significant (beta= 0.0014, $p < 0.05$). Political regime and EU predecessor membership remain non-significant.

Estimates of Fixed Effects^a

Parameter	Estimate	Std. Error	df	t	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
gdpgrowth	,001384	,000556	763,670	2,490	,013	,000293	,002476
regime	-,008053	,005984	442,610	-1,346	,179	-,019813	,003706
predecessor	-,020429	,013007	6,413	-1,571	,164	-,051766	,010908

a. Dependent Variable: IPO ratio.

Table 13

The impact of EU membership is estimated in model 7. Like in model 2, support for Hypothesis 1 is given by the variables significance (beta= 0.0188, $p < 0.05$). GDP growth is the only significant control variable (beta= 0.0014, $p < 0.05$) in model 7. The results support Hypothesis 1. See Table 14.

Estimates of Fixed Effects^a

Parameter	Estimate	Std. Error	df	t	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
[EU=0]	,018796	,005892	711,259	3,190	,001	,007228	,030364
gdpgrowth	,001432	,000553	763,567	2,589	,010	,000346	,002518
regime	-,008426	,005892	356,245	-1,430	,154	-,020014	,003163
predecessor	-,013352	,011438	6,817	-1,167	,282	-,040545	,013841

a. Dependent Variable: IPO ratio.

Table 14

Results for model 8 and for model 9 are shown in Tables 15 and 16. The results do not support Hypotheses 2 and 3, respectively. Adopting the Euro (beta= 0.0039, $p > 0.10$) and joining the Schengen-Area (beta=0.0016, $p > 0.10$) remain non-significant when grouping the countries. GDP growth, however, is now significant in models 8 and 9 (beta=0.0014, $p < 0.05$, in both cases). All other control variables remain non-significant.

Estimates of Fixed Effects^a

Parameter	Estimate	Std. Error	df	t	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
[EURO=0]	,003869	,004650	760,117	,832	,406	-,005259	,012997
gdpgrowth	,001406	,000557	762,500	2,526	,012	,000313	,002498
regime	-,009056	,006113	481,680	-1,482	,139	-,021067	,002955
predecessor	-,019540	,012971	6,502	-1,506	,179	-,050695	,011614

a. Dependent Variable: IPO ratio.

Table 15

Estimates of Fixed Effects^a

Parameter	Estimate	Std. Error	df	t	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
[Schengen=0]	,001666	,004921	625,673	,338	,735	-,007998	,011330
gdpgrowth	,001414	,000563	762,400	2,511	,012	,000309	,002520
regime	-,007818	,006001	397,269	-1,303	,193	-,019615	,003980
predecessor	-,019573	,013092	6,606	-1,495	,181	-,050908	,011762

a. Dependent Variable: IPO ratio.

Table 16

The results for the combined model 10 shown in Table 17 resemble the ones in model 5. GDP growth remains significant ($\beta=0.0014$, $p<0.05$), while the other two control variables are remain non-significant. Joining the EU is significant ($\beta=0.0194$, $p<0.05$), while adopting the Euro ($\beta= 0.0040$, $p>0.10$), and joining the Schengen-Area ($\beta= -0.0026$, $p>0.01$) are not. Therefore, the combined model provides support for Hypothesis 1, but not for Hypothesis 2 and 3.

Estimates of Fixed Effects^a

Parameter	Estimate	Std. Error	df	t	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
[EU=0]	,019393	,006080	744,117	3,190	,001	,007457	,031329
[EURO=0]	,003989	,004686	761,480	,851	,395	-,005211	,013188
[Schengen=0]	-,002589	,005085	655,398	-,509	,611	-,012575	,007396
gdpgrowth	,001409	,000560	761,231	2,515	,012	,000309	,002510
regime	-,009884	,006084	374,708	-1,625	,105	-,021848	,002080
predecessor	-,013573	,011765	6,964	-1,154	,287	-,041421	,014276

a. Dependent Variable: IPO ratio.

Table 17

When observing all ten models, one can see that becoming a EU member seems to have a significant impact on IPO activity. This impact is of positive nature. I.e. when a country joins the EU; an increase in IPO activity is expected. These results support Hypothesis 1. Contrary to this, and also considering all 10 models, adopting the Euro and joining the Schengen-Area, do not show to have a significant impact on IPO activity. Therefore, the results do not provide support for Hypothesis 2 and Hypothesis 3.

9. DISCUSSION AND CONCLUSION

The objective of this dissertation was to study the Impact of Economic Integration in the European Union on Initial Public Offering activity.

After laying the foundation for this study, by elaborating on the theories of Initial Public Offering activity and Economic Integration, the political and historical

development of Economic Integration provided context. One was able to assume a direct or indirect impact of Economic Integration on IPO activity.

To test this assumption, three Hypotheses were developed:

- Hypothesis 1: Economic Integration in the European Union, identified by a country joining the European Union, leads to a significant increase in IPO activity in that country.
- Hypothesis 2: Economic Integration in the European Union, identified by a country adopting the Euro as its currency, leads to a significant increase in IPO activity in that country.
- Hypothesis 3: Economic Integration in the European Union, identified by a country joining the Schengen-Area, leads to a significant increase in IPO activity in that country.

Based on a panel data set, containing all 28 EU countries, the Hypotheses were tested using 10 Multilinear Models.

The results provide support for Hypothesis one, but no support for Hypotheses two and three. Therefore, evidence is provided, that EU membership leads to an increase in IPOs in the new member country. The results show no impact of adopting the Euro, or joining the Schengen-Area, on IPO activity in the EU.

This dissertation aimed to test a relationship that has not been tested before. The answer provided is solid, but leaves room for improvement. The relationship could be tested with different models, to check if contrary results may be the outcome.

The originally planned comparable study on the three EFTA countries was, due to the scope of the dissertation, not conducted. This leaves room for further research. The impact of Economic Integration on IPOs could also be studied on a different set of economically integrating countries.

REFERENCES

- Alhorr, H.S.; Moore, C.B.; Payne, G.T. (2008). *The Impact of Economic Integration on Cross-Border Venture Capital Investments: Evidence from the European Union*. *Entrepreneurship Theory and Practice*, Vol. 32(5), p. 897–917.
- Ali, H.A.A. (2012). *Timing, Valuation and Post-Issue Stock Performance of the Initial Public Offerings (IPOs) and Rights Issues in the UK*. (Doctoral Dissertation). University of Exeter.
- Alti, A. (2005). *IPO Market Timing*. *The Review of Financial Studies*, Vol. 19, No. 3, pp. 1105-1138.
- Balassa, B. (1962). *The theory of economic integration*. London: George Allen & Unwin.
- Baldwin, R.; Wyplosz, C. (2006). *The economics of European integration*. London: McGraw-Hill Education.
- Barrios, S.; de Lucio, J.J. (2003). *Economic Integration and Regional Business Cycles: Evidence from the Iberian Regions*. *Oxford Bulletin of Economics and Statistics*, Vol. 65, No. 4, p 497-515.
- Batnini, F.; Hammami, M. (2015). *IPO Waves: How Market Performances Influence The Market Timing of IPO*. *The Journal of Applied Business Research*, Vol. 31, No. 5.
- Bauer, D.J. (2008). *Estimating Multilevel Linear Models as Structural equation Models*. *Journal of Educational and Behavioral Statistics*, Vol. 28, No 2, pp 135-167.
- Baxamusa, M.; Jalal, A. (2018). *Industry networks and IPO waves*. *Journal of Banking and Finance*, Vol. 88, pp. 129-146.

- Bello-Gomez, R.A.; Simon, K.; Wing, C. (2018). *Designing Difference in Difference Studies: Best Practices for Public Health Policy Research*. Annual Review of Public Health 2018. Vol. 39: pp. 453-469.
- Bernal, J.L.; Cummins, S.; Gasparrini, A. (2017). *Interrupted time series regression for the evaluation of public health interventions: a tutorial*. International Journal of Epidemiology, pp. 348-355.
- Bertrand, M.; Duflo, E.; Mullainathan, S. (2004). *How Much Should We Trust Differences-in-Differences Estimates*. The Quarterly Journal of economics, MIT press, Vol 119, No. 1, pp. 249-275.
- Bjorvatn, K. (2004). *Economic integration and the profitability of cross-border mergers and acquisitions*. European Economic Review, Vol. 48, pp. 1211-1226.
- Boeh, K.; Dunbar, C. (2014). *IPO waves and the issuance process*. Journal of Corporate Finance, Vol 25, pp. 455-473.
- Brau, J.C., Fawcett, S.E. (2006). *Initial Public Offerings: An Analysis of Theory and Practice*. The Journal of Finance, Vol. 61, No. 1, pp.399-436.
- Brenton, P.; Di Mauro, F.; Lücke, M. (1999). *Economic Integration and FDI: An Empirical Analysis of Foreign Direct Investment in the EU and in Central and Eastern Europe*. Empirica, Vol. 26, pp. 95-121.
- Burda, M.C.; Hunt, J. (2001). *From reunification to Economic Integration: Productivity and the Labor Market in Eastern Germany*. Brookings Papers on Economic Activity, Vol. 2.
- Colaco, H.M.J.; De Cesari, A.; Hedge, S.P. (2018). *The waiting period of initial public offerings*. The European Journal of Finance, Vol. 24, No. 5, pp. 363-390.
- Colak, G.; Günay, H. (2011). *Strategic waiting time in the IPO markets*. Journal of Corporate Finance, Vol. 17, pp. 555-583.

- Damsgaard, E. (2001). *European Economic History*. Copenhagen: Copenhagen Business School Press.
- Dee, P. (2007). *East Asian Economic Integration and its Impact on Future Growth*. *The World Economy*, pp. 405-423.
- Dicle, M.F.; Levendis, J. (2017). *IPO activity and market volatility*. *Journal of Entrepreneurship and Public Policy*, Vol. 7, No. 1. pp. 2-13.
- Doidge, C.; Karolyi, G.A.; Stulz, R.M. (2013). *The U.S. Left Behind: The Rise of IPO Activity Around the World*. *Journal of Financial Economics*, Vol. 110, No. 3, pp. 546-573.
- Edison, H.J.; Levine, R.; Ricci, L.; Slok, T. (2002). *International financial integration and economic growth*. *Journal of International Money and Finance*, Vol. 21, pp.749-776.
- El-Agraa, A.M. (1989). *The Theory and Measurement of International Economic Integration*. London: The MacMillan Press Limited.
- European Commission (2019). *The Schengen Area*. [Online]. Available from: https://ec.europa.eu/home-affairs/what-we-do/policies/borders-and-visas/schengen_en. [Accessed: August, 1st 2019].
- European Union (2019). *The history of the European Union*. [Online]. Available from: https://europa.eu/european-union/about-eu/history_en. [Accessed: August, 1st 2019].
- Hudson, J.; Fielding, S.; Ramsay, C.R. (2019). *Methodology and reporting characteristics of studies using interrupted time series design in healthcare*. *BMC Medical research Methodology*, Vol. 19, No. 137.
- Ibbotson, R. G; Jaffe, J.F. (1975). *"Hot Issue" Markets*. *The Journal of Finance*, Vol. 30, No. 4, pp 1027-1042.

- King, G. (1988). *Statistical Models for Science Event Counts: Bias in Conventional Procedures and Evidence for the Exponential Poisson Regression Model*. American Journal of Political Science, Vol. 32, No. 3, pp. 838-863.
- La Porta, R.I.; Lopez de Silanes, F.; Shleifer, A.; Vishny, R.W. (1997). *Legal Determinants of External Finance*. The Journal of Finance, Vol. 52, No. 3,.
- Lane, P.R. (2006). *The real Effects of European Monetary Union*. Journal of Economic Perspectives, Vol. 20, No. 4 , pp. 47-66.
- Litva, D. (2017). *Impact of European Integration on competitiveness of Czech regions*. Business, Management and Education, Vol. 15, No. 2, pp. 227-241.
- Lowry, M.; Schwert, G.W. (2002). *IPO Market Cycles: Bubbles or Sequential Learning*. The Journal of Finance, Vol. 32, No. 3.
- Meluzín, T.; Zinecker, M.; Lapinska, J. (2014). *Determinants of Initial Public Offerings: The Case of Poland*. Revista de Métodos cuantitativos para la economía y la empresa.
- Michailides, C. (2000). *Timing of Initial Public Offerings, Seasoned Equity Offerings and Takeover Bids financed with Equity. UK Evidence*. (Doctoral Dissertation). City University London.
- Molle, W. (1990). *The economics of European integration: theory, practice, policy*. Brookfield: Dartmouth Publishing Company.
- Newman, P.; Milgate, M.; Eatwell, J. (1992). *The new Palgrave Dictionary of Money and Finance*. London: The MacMillan Press Limited.
- Pastor, L.; Pietro V. (2005). *Rational IPO Waves*. The Journal of Finance, Vol. 60, No. 4, pp. 1713-1757.
- Plotnicki, M.; Szyska, A. (2014). *IPO market timing. The evidence of the disposition effect among corporate managers*. Global Finance Journal, Vol. 25, pp. 48-55.

- Santos, F. (2017). *IPO market timing with uncertain aftermarket retail demand*. Journal of Corporate Finance, Vol. 42, pp.. 247-266.
- Simionescu, M. (2018). *The Impact of Economic Integration on Migration in the European Union*. Holistica Journal of Business and Public Administration Vol. 9, No. 1, pp. 23-34.
- Tran, A.L.; Jeon, B.N. (2011). *The dynamic impact of macroeconomic factors on initial public offerings; evidence from time-series analysis*. Applied Economics, Vol. 43, pp. 3187-3201.
- Wooldridge, J.M. (2009). *Introductory Econometrics - A Modern Approach – 4th Edition*. Mason: South-Western Cengage Learning.
- World Bank (2019). *World bank Open Data*. [Online]. Available from: <https://data.worldbank.org/>. [Accessed: September, 21st 2019].

APPENDICES

Table 18

		Data Set Comparison - Descriptive Statistics - Zephyr																																
		Austria	Belgium	Bulgaria	Croatia	Cyprus	Czechia	Denmark	Estonia	Finland	France	Germany	Greece	Hungary	Iceland	Ireland	Italy	Latvia	Lithuania	Luxembourg	Malta	Netherlands	Norway	Poland	Portugal	Romania	Slovakia	Slovenia	Spain	Sweden	Switzerland	United Kingdom	Total	
N	Valid	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22
	Missing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean		3,41	6,73	4,50	3,32	7,09	,68	5,32	,55	4,41	41,36	44,09	6,95	2,05	1,05	4,55	18,50	,45	,82	4,05	,64	9,88	12,00	32,36	1,41	1,36	,09	,45	9,59	33,18	17,27	141,27	419,18	
Range		12	20	12	52	66	3	21	3	17	110	167	45	7	4	12	41	2	3	11	3	28	41	121	4	5	1	2	26	67	88	330	693	
Minimum		0	0	0	0	0	0	0	0	0	6	1	0	0	0	1	4	0	0	0	0	0	0	3	0	0	0	1	3	1	1	25	172	
Maximum		12	20	12	52	66	3	21	3	17	116	168	45	7	4	13	45	2	3	11	3	28	41	124	4	5	1	2	27	70	89	355	865	
Sum		75	148	99	73	156	15	117	12	97	910	970	153	45	23	100	407	10	18	89	14	213	264	712	31	30	2	10	211	730	380	3108	9222	

Table 19

Data Set Comparison - Descriptive Statistics - Thomson Reuters

	Austria	Belgium	Bulgaria	Croatia	Cyprus	Czechia	Denmark	Estonia	Finland	France	Germany	Greece	Hungary	Iceland	Ireland	Italy	Latvia
N	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22
Valid	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Missing	2,95	5,68	1,00	,36	1,05	,50	4,50	,45	5,05	38,77	29,73	9,50	,73	,18	4,05	16,05	,27
Mean	12	17	9	5	5	2	16	4	20	109	146	47	4	1	12	37	2
Range	0	0	0	0	0	0	0	0	0	7	1	0	0	0	0	2	0
Minimum	12	17	9	5	5	2	16	4	20	116	147	47	4	1	12	39	2
Maximum	65	125	22	8	23	11	99	10	111	853	654	209	16	4	89	353	6

Data Set Comparison - Descriptive Statistics - Thomson Reuters

	Lithuania	Luxembourg	Malta	Netherlands	Norway	Poland	Portugal	Romania	Slovakia	Slovenia	Spain	Sweden	Switzerland	United Kingdom	Total
N	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22
Valid	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Missing	,64	2,23	,27	6,86	8,32	16,64	1,14	,50	,05	,14	5,68	13,64	6,64	93,36	276,91
Mean	4	6	1	22	28	76	6	2	1	1	15	51	17	266	685
Range	0	0	0	0	0	0	0	0	0	0	0	0	0	8	59
Minimum	4	6	1	22	28	76	6	2	1	1	15	51	17	274	744
Maximum	14	49	6	151	183	366	25	11	1	3	125	300	146	2054	6092