



LISBON
SCHOOL OF
ECONOMICS &
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UNIVERSIDADE DE LISBOA

**MASTER OF SCIENCE IN
FINANCE**

**MASTERS' FINAL WORK
DISSERTATION**

**SINGLE RESOLUTION MECHANISM – THE IMPACT ON
EUROPEAN BANKS' RISK**

ANDRE FILIPE TANQUE DE JESUS

OCTOBER – 2018



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Abstract

As soon as the Lehman Brothers' file for bankruptcy rocked global financial markets, a wave of State capital injections into banks emerged in Europe, and every lawmaker on that side of the Atlantic knew straight away that something had to change. However, it was only five years later that the European Union set the first stone for the Single Resolution Mechanism (SRM). On May 21st, 2014, the then 26 Member States agreed on the creation of the Single Resolution Fund (SRF), the foundation of what is now the European economy's safety-net before the banks.

Yet, has this proven to be successful? That is something only time will be able to answer. For now, this study aims to understand if the Single Resolution Mechanism had an immediate impact on the European banks' risk.

As we will be able to demonstrate further on, based on market data from before and after this agreement, the European Union banks' risk, measured by beta, was significantly reduced when compared to the average of every other sector. At the same time, we show that volatility also improved on banks, while actually increased among the other companies. Finally, we attempt a region analysis by comparing companies from the "Core", "Nordic", and "Peripheral" countries in the European Union, concluding the first group was able to take more advantage from this process based on their beta.

Resumo

Assim que a falência do Lehman Brothers abalou os mercados financeiros mundiais, emergiu na Europa uma onda de injeção de capital em bancos, levando a que todos os responsáveis políticos desse lado do Atlântico soubessem, de forma imediata, que algo teria de mudar. Contudo, apenas cinco anos depois, a União Europeia deu o pontapé de saída para o Mecanismo Único de Resolução (SRM, na sigla anglo-saxónica). A 21 de maio de 2014, os então 26 Estados Membros chegaram a acordo para a criação do Fundo Único de Resolução (SRF, na sigla anglo-saxónica), a fundação daquela que é, atualmente, a rede de segurança da economia europeia perante os bancos.

No entanto, terá esta medida sido bem sucedida? Isso é algo que só o tempo poderá responder. Por agora, este estudo procura compreender se o Mecanismo Único de Resolução teve um impacto imediato no risco sistémico dos bancos europeus.

Como poderemos demonstrar mais à frente, com base em dados de mercado recolhidos nos períodos antes e depois do acordo, o risco sistémico dos bancos europeus, medido pelo beta, melhorou substancialmente, quando comparado com a média dos restantes sectores. Ao mesmo tempo, revelamos que houve uma redução da volatilidade dos bancos, ao passo que nas restantes empresas acabou mesmo por deteriorar-se. Finalmente, procuramos fazer uma análise regional comparando as empresas dos países “Centrais”, “Nórdicos” e “Periféricos” da União Europeia, concluindo que o primeiro grupo tirou maior partido deste processo, com base o beta.

Acknowledgments

This Dissertation marks the end of a two-year period of great efforts, but more importantly of great accomplishments. I first joined the Financial Analysis Post-Graduate as a financial journalist, but I now leave this Master as an interest rates derivatives' front office specialist in one of the world's biggest investment banks. More than title, this is definitely the biggest proof I have that hard work and intensive learning does pay off.

In this sense, I would like to thank first to my supervisor, Professor Catedrático João Luís Correia Duque, who has been supporting me from the very beginning, always guiding into the right direction, complementing my work with unparalleled insights and the greatest advises. If it is true that I recognize his enormous knowledge, I must also point out all the time he spent with me to make this Dissertation as good as possible. I do apologize, however, as I believe I could have made this an even superior work.

To my family, specially my mom, for always believing that I had it in me, and for every inch of support in every step of the way. You have encouraged me to trust my gut, you have cheered me up when I had no more energy, you always had the kind word in the exact time that I was missing it. I could have done it alone, but it would have never been as good as it was. I hope all of you finish this stage as proudly as I am.

Finally, I could never forget my closest friends. The ones that never left my side, even if I would not call for months. The ones who made sure every now and then that I was still mentally sane, following weeks of continuous work. The ones that never doubted that I was still the same, even if I had to prioritize my personal investment during these years, neglecting our friendship, and more importantly their own needs. To every single one of them, my sincere thank you.

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List of Abbreviations

BRRD – Bank Resolution and Recovery Directive

CAPM – Capital Asset Pricing Model

EBU – European Banking Union

ECB – European Central Bank

EC – European Commission

EDIS – European Deposit Insurance Scheme

EFSF – European Financial Stability Facility

EFSM – European Financial Stabilization Mechanism

EMU – Economic and Monetary Union

ESM – European Stability Mechanism

EU – European Union

GDP – Gross Domestic Product

IMF – International Monetary Fund

SRB – Single Resolution Board

SRF – Single Resolution Fund

SRM – Single Resolution Mechanism

SSM – Single Supervisory Mechanism

USA – United States of America

1. Introduction

Some may argue against it, some may even say they have warned about it before, but truth is that it was only the Lehman Brothers' file for bankruptcy that set every central bank and other major financial institutions on crisis' mode. While the "Subprime Crisis" – as it will be forever known – may rest as the inception of the biggest financial turbulence the world has seen since the Great Depression, not a single economist or financial expert questions the existence of other systemic issues at that time, and their role on the extent of spillovers through-out the World Economy.

ING, Royal Bank of Scotland, Lloyds, Fannie Mae, Fannie Mac, and many others siding along with the Lehman Brothers. Either through state aid, or a definitive bankruptcy, these banks were directly affected – and some still are – by the Subprime Crisis, but also by "the weaknesses of the institutional framework" (Cœuré, 2013)", at least in the European Union, region that we try to analyze in this study.

Portugal was no exception. Following a few bankruptcies and some other State liquidity injections – either through equity or debt –, as well as three years of a successful economic adjustment program (Lall, 2015), Novo Banco was the setback that Portugal was not yet prepared for. However, it was an enormous live test for the European Union (EU), as well as for the framework its policymakers had drawn in the previous years.

The European Banking Union, comprising three main pillars – the Single Supervisory Mechanism (SSM), the SRM, and the still to be concluded European Deposit Insurance Scheme (EDIS) –, was seen as "a unique opportunity to restore confidence and attract private investors", being a strong SRM characterized as "essential" (Draghi, 2013). Given the experiment period is still short, its effectiveness is yet to be proven.

Inspired by the Portuguese test, this study tries to answer the question: “Did the SRM have any impact on European banks' risk?” In this sense, we formulated the below hypothesis:

H0: The creation and introduction of the SRM had a positive impact on European banks' risk

H1: The creation and introduction of the SRM had either a negative or no impact on European banks' risk

For this analysis, we compare both banks and non-banks European stocks, arguing the first group took advantage from the SRM. Additionally, we find evidence that a region focus proves that “Core” European countries were the most positively impacted from this European Banking Union pillar, contrasting with the still positive – although less significant – impact on Peripheral banks.

In order to develop this analysis, we start by considering every company listed on STOXX 600 Index, from a specific time frame and after a thorough process of standardization, ending up with a list of 372 corporations. Based on Capital Asset Pricing Model's (CAPM) we then analyze market data for each stock, computing individual measures of systematic risk and total risk (betas and volatilities), in addition to aggregated results for both risk measures.

Finally, we present the outcome and discuss it under the conception of the SRM, focusing on what may have been the rational motivation on the back of the results we will present further on. We then conclude by recommending further studies to develop this topic, as well as to enhance the analysis of the European Banking Union's contribution for financial stability.

2. Literature Review

2.1 The Single Resolution Mechanism

As every other crisis, the “Subprime” started showing small warning signs that ended up sounding like emergency alarms. By September 15th, 2008, Lehman Brothers was so buried in mortgages that the real estate market downturn left its Board with no option but to file for bankruptcy. Still the biggest the United States of America (USA) have ever seen, this was the point of no return for what is now seen as the biggest financial crisis since the Great Depression.

Various institutions were affected by the Subprime Crisis, not only in the USA, but also in Asia and, more importantly, Europe. As the saying goes, “when the US sneezes, the world catches a cold”. And this was the perfect example, as the Lehman Brothers’ bankruptcy flooded the global financial markets with chaos. In the following month, the Standard & Poors 500 index gathered a loss of 28.16%, while the Stoxx 600 – its European counterpart – sank by 26.85%, and the Japanese Nikkei 225 saw its value decrease by 32.24%, data compiled by Bloomberg Terminal shows.

The spillover effect was no news for the global lawmakers. Although not as aggressive, the “Dotcom Bubble” had had seemingly effects throughout international markets, as had its predecessors. However, the world economy was in a much worst state, a factor that amplified the financial crisis’ turbulence. A great example is precisely the debt burden Eurozone members accumulated until then, and past that date. Greece, Ireland, Portugal, Spain, and Cyprus were the face of a doomed economy filled with both public and private indebtedness, which had to be rescued by a “troika” of organizations – the International Monetary Fund (IMF), the European Commission (EC), and the ECB.

Compared to Germany, largely seen as a rather stable economy, and as shown by the charts below, based on data compiled by the IMF, all the aforementioned five countries already suffered from an excessive either public or private debt, and in some cases both. Although this was not a result of the 2007 and 2008 turbulence, it was deepened by the financial chaos that arrived to a poorly structured Eurozone. And all this weakness could not even be seen as a surprise. Back in 2012, Philip R. Lane stated that “the capacity of the euro-member countries to withstand negative macroeconomic and financial shocks was identified as a major challenge for the success of the euro from the beginning.” The author, now Governor of the Central Bank of Ireland, explains that currency devaluations were an important and “traditional adjustment mechanism” left outside the Euro borders. Moreover, the monetary union was an incomplete one, as it “was not accompanied by a significant degree of banking union or fiscal union.” And this issue carried the Eurozone to the epicenter of its real source of instability: its financial institutions.

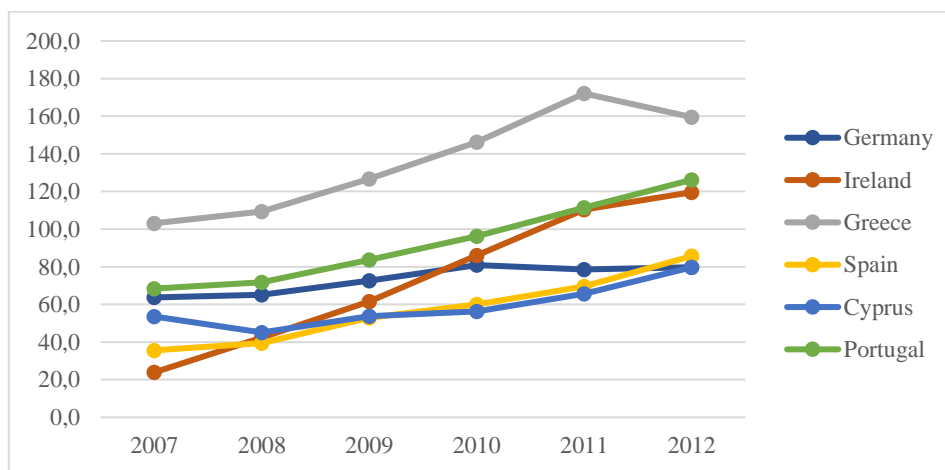


Figure 1 – Percentage of Government Consolidated Gross Debt per GDP

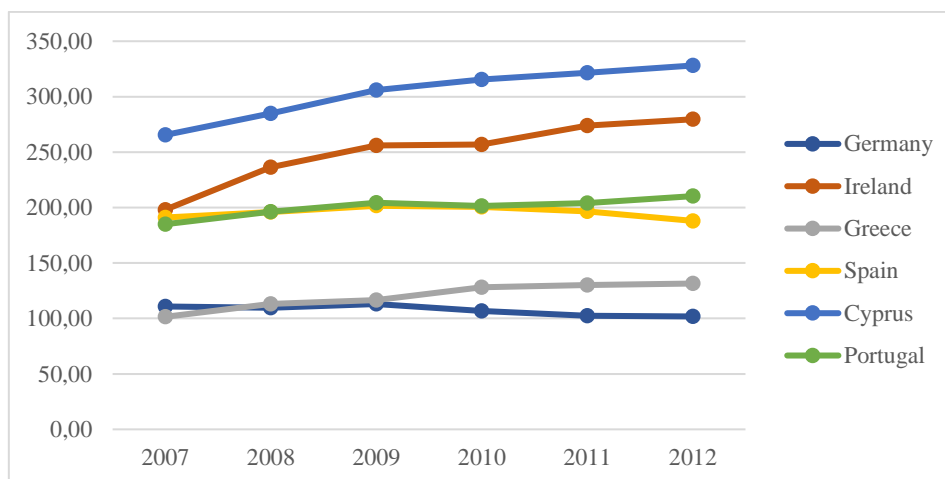


Figure 2 – Percentage of Consolidated Private Debt per GDP

As its US counterparts, European financial institutions were highly swamped in real estate assets, either by direct investment, or backed securities. With a declining housing market, combined with a financial turbulence not seen since the Great Depression, these institutions were every lawmaker's concern from the very beginning, mainly in the already troubled countries. "Since banking regulation remained a national responsibility, individual governments continued to carry the risks of a banking crisis: both the direct fiscal costs (if governments end up recapitalizing banks or providing other forms of fiscal support), and also the indirect fiscal costs since GDP and tax revenues tend to remain low for a sustained period in the aftermath of a banking crisis (Lane, 2012)." And this was exactly what happened.

Ireland was the first big example. Due to "losses on large commercial real estate loans of over 50 percent", the Irish government had to provide "up to 64 billion euros to the banks – amounting to about 40 percent of GDP (Schoenmaker, 2015)." On top of an already troubled economy, the financial institutions' capital needs led the country to seek financial assistance from the "troika". This ended up on an agreement on November 29th, 2010, worth 67.5 billion euro of loans from these institutions. Greece, however, was the first country to request a bailout programme, on April 23rd, 2010. But soon after the situation deteriorated. One year and half later the country was signing up for its second

financial assistance package – it was only eight years later that Greece was able to exit from the “troika’s” assistance, following a total of three bailouts.

This Eurozone tragedy was far from over. Portugal agreed on a 78-billion-euro loan during the first half of 2011, while one year later Eurogroup approved a 100-billion-euro credit line for Spanish troubled banks. On the exact same month, June 2012, Cyprian government became the last country to seek financial assistance, culminating on a 10-million-euro financial assistance program. To sum up, five different countries, with five specific financial restrictions and macroeconomic circumstances, were a joint front of the so-called “Eurozone Sovereign Debt Crisis”. But what did these countries have in common? All had to inject billions of euros to save its banks.

This was exactly the starting point for the restructure of Eurozone’s frameworks. The European Financial Stabilization Mechanism (EFSM), created for European Union members, as well as the European Financial Stability Facility (EFSF), and the European Stability Mechanism (ESM), both specifically designed for the Eurozone, were the first big steps on providing a more coordinated assistance to countries with financing difficulties. However, the boldest move would follow a call for a robust European Banking Union, which would comprise three main pillars: The SSM, the SRM, and the EDIS.

Christine Lagarde (2012), Managing Director of the IMF, was the first significant lawmaker to point out the needed developments in the Eurozone, during a speech on April 17th, 2012. Calling for “stability”, Lagarde considered that “we must break the vicious cycle of banks hurting sovereigns and sovereigns hurting banks.” How? Risk sharing across borders is absolutely needed, she considered, which means that “monetary union needs to be supported by stronger financial integration which our analysis suggests be in the form of unified supervision, a single bank resolution authority with a common backstop, and a single deposit insurance fund (Lagarde, 2012).” One week later, Mario

Draghi (2012), President of the ECB, stated before the European Parliament that the financial crisis showed “strong negative spill-over effects across euro area countries and between the banking sector and its respective sovereigns.” Draghi criticized the fact that large financial institutions were often seen as European, but would always fall on a country-level responsibility during bad times (Draghi, 2012). For that reason, he argued, “ensuring a well-functioning EMU [Economic and Monetary Union] implies strengthening banking supervision and resolution at European level.”

Besides the importance of these remarks, the most significant public act in favor of an enhanced European Banking Union came two months later by Herman Van Rompuy, then President of the European Council. Presenting a report prepared with the support of the European Commission, the Eurogroup, and the European Central Bank, Van Rompuy directly appealed for “an integrated financial framework to ensure financial stability in particular in the euro area and minimize the cost of bank failures to European citizens.” Calling for an architecture structured both on a European and national levels, Van Rompuy insisted that, “as soon as possible”, this new framework must include an integrated supervision, a deposit insurance scheme, as well as a resolution scheme (Van Rompuy, 2012).”

By September 2013, the Single Supervisory Mechanism obtained all the necessary approvals, and came into effect one year later. The Single Resolution Mechanism had, however, a lengthier process, with the SRF being approved on May 21st, 2014, while the SRM only entered into force by January 1st, 2016. Still to be concluded is the European Deposit Insurance Scheme, which has yet no fixed date to become fully effective.

2.1.1 Shareholders, Creditors and Depositors

For years, a bankrupt bank meant a complete loss on any associated investment. Shareholders, creditors, and depositors would see all their money simply disappear, and

the economy would be the collateral damage. The mitigation of these effects was the cornerstone for the European Banking Union, following the consequences felt during the late financial crisis. The solution, however, did not mean that any investment was safe under a resolution scenario.

As Silvia Merler (2017) explains on her Policy Contribution for the Bruegel Institute, a bank that is put into resolution will have its shareholders and creditors cover the losses up to 8% of the institution's liabilities, as required by the Single Resolution Mechanism Regulation, before the SRF can be also used in the recapitalization. "Depending on the composition of individual banks' balance sheets, this may imply the bail-in of senior debt and potentially even uncovered deposits (Merler, 2017)." At the same time the current European legislation protects up to one-hundred-thousand deposits per bank account and depositor. The remaining amount can be declared as forgiven debt, and used to cover the banks' losses. Same thing for junior and senior debt, although with different levels of prioritization.

This is exactly what happened with Banco Espírito Santo – during which a later transfer of debt responsibilities from its "good bank" to its "bad bank" originated a consortium of complaining bondholders led by BlackRock and Pimco –, but also more recently with Banco Popular. Although Banco Santander had to inject seven billion euros as the acquiring bank, there was also a 3.3-billion-euros bail-in from Popular's equity and debt. Additionally, Intesa Sanpaolo also benefited from a complete wipe-out of equity and junior debt, when acquiring Veneto Banca and Banca Popolare di Vicenza.

2.1.2 Banco Espírito Santo's Resolution

With more than a century of history, Banco Espírito Santo (BES) was one of the biggest private financial institutions in Portugal. Although it had been hit by the crisis, as every other Portuguese bank, BES' Board had always avoided any kind of financial

assistance from the Portuguese government, in opposition to its competitors BCP and Banif, for example. However, BES was controlled by a family-owned holding, which is currently being accused of embezzling money from the bank – many members of the Espírito Santo family, as well as previous BES' Board members, are currently facing a court trial due to these allegations.

Although these accusations are yet to be proven, truth is BES's financial stability was in a very bad shape. Endless news surrounding the family holding and its implications into the bank's robustness drove its clients into a ran for deposit withdrawals. By June 2014, BES completed a capital increase of over one billion euros, in order to improve its capital ratios. But only a week later its Chief Executive Officer, Ricardo Salgado – also a member of the Espírito Santo family –, was removed from office by the Banco de Portugal (BdP), ECB's Portuguese arm and the entity responsible for overseeing the national banking system.

The news flow did not get better, the share price kept plumping, and liquidity needs were increasingly pressing. On August 3rd, 2014, Carlos Costa, Governor of the BdP, announced on a televised statement that BES had been subject to a resolution, having been split into a “good bank” – then rebranded into Novo Banco –, and a “bad bank”, which kept BES' designation. Although the BdP was more than a year apart from the effective date of the Bank Resolution and Recovery Directive (BRRD), the Portuguese central bank decided to apply almost the same procedure, but under the national resolution framework, as well as the European competition laws. A total of 4.9 billion euros were injected into the bank through the Resolution Fund – the vehicle created through contributions made by every bank in the Portuguese system, in order to finance any needed resolution –, following a loan provided by Portuguese government.

“Under this solution, the use of State resources will only assume the nature of a lending operation to the [Resolution] Fund, and not a capitalization one, protecting those

resources from the risks associated with a stakeholder position, or a direct creditor of a single financial institution.”

In Banco de Portugal (2014), p. 5.

Given that Portugal had finished its Financial Assistance Programme one month earlier, the resolution was seen as the best way to save one of the country's biggest banks, while protecting its still debilitating economy from a possible bankruptcy, and making sure it would not worsen the already high borrowing needs. BES then became the live experiment of the future BRRD, testing purpose that led to its design. Successful? Some may argue in favor, some against it, but four years later the BdP was able to show Novo Banco as an already privatized bank, following its antecessor's restructure.

On the other hand, the remaining Portuguese banks currently bear the cost of this resolution. As sole shareholders of the resolution fund, these institutions will now face years of contributions until the fund is able to repay the State for the borrowed 4.4 billion euros, granted under the 4,9 billion euros capitalization. Although these banks will have around 30 years to reimburse the Portuguese government, the cost might be seen as very significant given how small the sector is in Portugal. However, the systemic impact of an unorderly dissolution of BES could have been too big for some banks to bear.

From all that have just been said it is reasonable to expect some impact on the banking industry, with a particular focus on share prices of listed banks. In fact, with the SRM shareholders were put in the front row of capital liability. When equity capital seems insufficient and fails to overcome the stress tests, shareholders are asked to increase the bank capital needs. Shareholders seem to have shorted put options on the bank equity capital, since the underwrite of new capital is done at nominal terms while in the market share prices are usually revealed at a significant discount immediately after these moments of crisis. But in another perspective, the new structure carried along with the recently born SRM brings stability and knowledge to the field of what has to be done in

a moment of a banking crisis. This is even more relevant after the collapse of BES, the first big bank in Europe to taste the flavor of a resolution under the European framework.

We are aware that the banking sector has been under a significant change after the crisis, hence why the SRM may not be considered the only factor to have an impact on equity prices. The banking industry has suffered a lot of recent changes on size, activity, the cleaning of non-performant loans, equity capital injections, and even a series of forced mergers. We are also aware that the Banking Union started in the EU is based on two concluded pillars from which the SRM is just one of the components. However, in contrast with the other pillar (the Single Supervisory Mechanism) it seems that SRM has a more direct impact on shareholders cash-flows. This comes from the obligations that SRM calls on banks' shareholders.

2.2 Capital Asset Pricing Model

The lack of knowledge surrounding risk and its implications was struck by the 1960 decade. In 1962, Treynor set as an objective to “lay the groundwork for a theory of market value which incorporates risk”. Through an unpublished paper, the author defined that the goal was not “to present a fully developed apparatus for computing the cost of capital in practical problems”, but rather to “explore the manner in which risk affects investment value”, among others. For this, and in order to simplify the model, in line with other academics at that time, Treynor set a list of assumptions quoted below:

1. There are no taxes.
2. There are no frictions, such as brokerage costs, to inhibit buying and selling.
3. The effects of the individual investor's decisions on prices is small enough to be disregarded.
4. Investors maximize expected utility, which primary concern for the first and second moments of the distribution of outcomes.
5. Investors are assumed to be risk averse.

6. A perfect lending market exists.
7. Investors have perfect knowledge of the market, which we interpret to mean that every investor:
 - a. Knows actual prices,
 - b. Has homogeneous prospects on future risk, investment values and cash-flows.

Based on Tobin's "concept of dominance" (1958), in which he argues that a specific composition of risky assets would overcome all others, in any given level of risk, Treynor dug further to come up with the notion of risk premium. Under Treynor's analysis, "the expected yield to the investor is the sum of 1) a return on his capital at the risk-free lending rate which is independent of how he invests, and 2) an expected return for risk taking which depends only on the risk taken and is independent of his capital."

A similar view is later presented by Sharp (1964). When determining an asset price, and assuming the importance of an equilibrium interest rate, the author highlights that "somehow a market risk-premium is also determined, with the prices of assets adjusting accordingly to account for differences in their risk (Sharp, 1964)." In other words, the investor has to face "the price of time, or the pure interest rate, and the price of risk, the additional expected return per unit of risk borne".

However, and recognizing the importance of the aforementioned factors, Sharp highlights it is "difficult to give any real meaning to the relationship between the price of a single asset and its risk." In this sense, the author points out the importance of building up "a market equilibrium theory of asset prices under conditions of risk". Following a description of the "total utility function" for which investors would always prefer higher expected returns with lower levels of risk for the same return, Sharp explains how important the "investment opportunity curve" is on the decision-making process, stressing, however, the role of correlation among investment opportunities.

Sharp contradicted to the conclusion that “in equilibrium there will be a simple linear relationship between the expected return and standard deviation of return for efficient combinations of risky assets.” However, he says, “there will be a consistent relationship between their expected returns and what might best be called *systematic risk*”, a concept introduced by him.

Based on a linear regression between the return of one asset (R_i) and the market portfolio (R_g), Sharp argues “the scatter of the R_i observations around their mean [...] is, of course, evidence of the total risk of the asset”, i.e., its standard deviation. “But part of the scatter is due to an underlying relationship with the return on combination g, shown by B_{ig} , the slope of the regression line”. Consequently, the author emphasizes that “the response of R_i to changes in R_g [...] accounts for much of the variation in R_i ”, concluding this is the asset’s total risk component he coined as systematic risk.

The same idea was argued by John Lintner one year later. Presenting his theorem “Under Idealized Uncertainty, in purely competitive markets or risk-averse investors”, the author states that equilibrium “requires that the values of all stocks will have adjusted themselves so that the ratio of the expected excess aggregate dollar returns of each stock to the aggregate dollar risk of holding the stock will be the same for all stocks [...], when the risk of each stock is measured by the variance of its own dollar return and its combined covariance with that of all other stocks (Lintner, 1965).”

Albeit under different words, Lintner’s conclusion flows into Sharp’s notion of systematic risk: “the aggregate value of the i^{th} stock is [not only] related to the concurrent market values of the other stocks”, but actually of “all stocks”, i.e., there is a relationship between the value of a market (or portfolio), and its individual assets.

Following Treynor’s and Sharp’s ground-breaking work, Lintner helped to better understand what would later be known as the single-factor Capital Asset Pricing Model (CAPM). However, Fisher Black, Michael C. Jensen, and Myron Scholes argued, on a

joint paper published on 1972, the models presented so far did not “provide a complete description of the structure of security returns”. In this sense, the authors proposed a new model which they coined as two-factor CAPM, now known as the single-factor CAPM.

Starting from what was then known as the traditional form of the model – $E(\tilde{R}_j) = \gamma_1 \beta_j$, where $\gamma_1 = E(\tilde{R}_M)$, the excess return on the market portfolio –, the authors argued that a better model would be obtained from the “relaxation of the assumption that riskless borrowing and lending opportunities are available”, leading to a *two-factor model*:

$$(1) \quad E(\tilde{R}_j) = E(\tilde{r}_z) + [E(\tilde{r}_M) - E(\tilde{r}_z)]\beta_j$$

Where:

$E(\tilde{R}_j)$ is the expected return of security j ;

$E(\tilde{r}_z)$ is the expected return of a zero-covariance portfolio, also known as riskless rate;

$E(\tilde{r}_M)$ is the expected return of a market-based portfolio;

β_j is the systematic risk of security j .

Introducing γ_0 into the traditional model ($\gamma_0 = E(\tilde{r}_z)$, “which is not necessarily zero”), the authors proved through empirical tests what other academics, including Jensen himself, had already argued about. Specifically, Black, Jensen, and Scholes enlightened that “the relation between mean excess return and β was linear”, but the slope, however, would change over time, hence backing up the rejection of the traditional model, and the assumption that γ_0 was not equal to zero. Furthermore, and although lacking clarifications for the existence of the *beta factor*, the authors “have established the presence and significance of the *beta factor* in explaining securities returns”.

This contribution of Black, Jensen, and Scholes (1972), following the groundbreaking analysis presented by Sharp (1964) and Lintner (1965), is still seen as the cornerstone for the CAPM. And despite acknowledging this, Eugene F. Fama and Kenneth R. French pointed out that “the empirical record of the model is poor – poor

enough to invalidate the way it is used in applications (2004)". In this sense, and based on the "Intertemporal Capital Asset Pricing Model" presented by Merton (1973), Fama and French assume the need for a multifactor model that rectifies the single-factor model's inefficiencies. And focused on providing better variables that affect expected returns, the authors settle on investment's size and book-to-market ratio.

"The returns on the stocks of small firms covary more with one another than with returns on the stocks of large firms, and returns on high book-to-market (value) stocks covary more with one another than with returns on low book-to-market (growth) stocks", claim the authors, explaining that "there are similar size and book-to-market patterns in the covariation of fundamentals like earnings and sales". Under these assumptions, the authors proposed a three-factor model:

$$(2) \quad E(R_{it}) - R_{ft} = \beta_{iM}[E(R_{Mt}) - R_{ft}] + \beta_{is}E(SMB_t) + \beta_{ih}E(HML_t)$$

Under this equation, SMB_t is the difference between the return of small and big stocks, while HML_t is the difference between the return of stock with high book-to-market ratios versus those with small ratios. Regardless the advantages, the authors recognize this is "hardly a panacea", highlighting the momentum effect, also described by Jegadeesh and Titman (1993). "Stocks that do well relative to the market over the last three to twelve months tend to continue to do well for the next few months, and stocks that do poorly continue to do poorly", say the authors. However, "this momentum effect is distinct from the value effect captured by book-to-market equity and other price ratios", being "left unexplained by the three-factor model, as well as by the CAPM."

3. Methodology and Data

This dissertation aims to answer the following question: "Did the creation and introduction of the SRM have any impact on European banks, measured by their risk?" In

order to do this, we focused on Stoxx 600 index, as the European stock market benchmark (Prather-Kinsey et al, 2008; Horvath, R., & Petrovski, D., 2012), as well as all companies that belonged to this index on a specific time frame. A total of 700 companies were then considered, but only 372 were included in the final sample of this study. Some firms had to be excluded given their country is not subject, nor has an agreement with the ECB to be subject to the SSM and the SRM. Additionally, other companies were not considered due to a number of reasons related with the lack of available observations as a result of: a) delisting of companies; b) mergers and acquisitions; c) short time after exchange listing; d) very low liquidity, resulting in very few days of trading; e) companies with the trading halted.

Given this final sample of 372 companies plus the Stoxx 600 index, fortnightly dividend-adjusted prices, as well as the index weights for each component stock, were then collected from Bloomberg. The time period for the sampling run from August 5th 2011 and November 21st 2013 (the estimation period), as well as November 20th 2014 and March 9th 2017 (the event window). The intermediate period between November 21st 2013 and November 20th 2014 was excluded since May 21st, 2014, corresponds to the date on which EU governments reached an agreement for the creation of the Single Resolution Mechanism. With the selected data, we were able to compute the beta and volatility of each stock, as well as a weighted average beta, allowing us to draw an analysis for each stock before and after the event. The analysis was carried comparing “Banks” with all the other sectors (non-banks that were called “Others”). Finally, a geographical analysis was also possible, splitting the 372 companies into three categories: “Core”, “Nordic”, and “Peripheral”.

3.1 Variables

3.1.1 Dividend Adjusted Stock Prices

In order to compute the main factors in this study, we had to extract each company's dividend adjusted stock prices, but also for the Stoxx 600 index. This data allowed us to compute the volatility and the beta for each stock, according to the single factor CAPM. Given that this calculation was done for both time periods – the estimation period before the introduction of the SRM and the event window after the introduction of the SRM on May 21st, 2014 –, we are able to compare not only the changes on each indicator observed by company, but also an estimated average beta per sector.

3.1.2 Index Weight

Although a simple analysis might be conclusive enough, we understood that a weighted average beta would dissipate any size fallacies an average beta might include. In this sense, we extracted the weight of each company on Stoxx 600 index for the period under analysis, later computing an average weight for each one. As many companies did not belong to Stoxx 600 throughout the entire period, we estimated an average based on the available data. When companies were components of the index for a smaller time period, we assumed their weight was constant for the entire sampling period.

3.1.3 Industry Sector

Each company was classified by industry sector, in order to allow a comparison between “Banks” and “Others” (non-banks). This is a vital determinant in our study, as we aim to prove if the SRM had a specific impact on European banks risk. In this sense, the whole analysis focuses on this two sub-groups, and their performance prior and past the EU member states agreement for the implementation of the SRM.

3.1.4 European Region

In addition to the sectorial analysis, which is the main purpose of this dissertation, we also try to draw a comparison between each European region: “Core”, “Nordic”, and “Peripheral”. During and following the European Sovereign Debt Crisis, a line was delineated in Europe, dividing the troubled countries and categorizing these as “Peripheral”. Therefore, we believe important conclusions can be obtain from a specific evaluation of SRM’s impacts on Europe’s different regions.

3.2 Methodology

3.2.1 Event Studies

We aim to test the existence of any impact from the creation and introduction of the SRM on European banks’ risk. The SRM was decided on May 21st, 2014, and we considered this date as the trigger point for any development on our population under analysis. We then based our analysis on the market model of Events Studies methodology, developed by Fama et al (1969). The authors argued in favor of the efficiency of this model, although they have applied it to their specific study of stock splits, characterized by short period analysis. This is a deviation from our study, justified by the fact that the SRM represents a structural change, hence with a long-term effect. Based on Novo Banco example and other following cases, the market had to absorb each event in order to reach thorough conclusions on SRM’s impact.

We then started by excluding the 26-week period, before and after May 21st, 2014, in order to avoid any turbulence around this date, first given that this decision was followed by extended discussions, and secondly assuming its longer period of absorption by the market. This is considered the event. Although the Events Studies methodology is widely used to analyze “the behaviors of security prices around an event”, which is

usually based on short term data, “applications of this tool are also frequent in other fields such as law and economics to measure, for example, the effect of a change in the regulatory environment on the value of a firm (Duque & Pinto, 2011)”.

Consequently, we selected two sample periods of 61 data points: a) the estimation period that lasted from August 5th, 2011 to November 21st, 2013 and b) the event window that lasted from November 20th, 2014 to March 9th, 2017. The data was collected with a fortnight time interval between two consecutive observations which lead us to capture 61 observations for each company either during the estimation period either during the event window. The commonly recommended five years of sampling period with monthly data (Black et al, 1972; Banz, 1981) was not possible in this case, because we are still within the 5-years event window if that was the time window chosen.

3.2.2 Single Factor CAPM

Following Sharp's (1964) and Lintner's (1965) proposal of a single factor CAPM, combined with Fama et al (1969) Events Studies methodology, we computed the fortnightly \log_e returns for every security, and for the Stoxx 600 index, on both sampling periods. We used Excel to estimate the betas, as well as the volatility. The volatility was found by estimating the standard deviation of the log returns as in equation (3).

$$(3) \quad s = \sqrt{\frac{\sum_{i=1}^N (x_i - \bar{x})^2}{N-1}} \quad (i = 1, 2, \dots, N)$$

The annual figures for volatility were found by multiplying the raw standard deviations by $\sqrt{26}$ given that one year has about 26 fortnightly observations). These annual figures were also classified sector, and region.

4. Analysis

4.1 Average Beta and Weighted Average Beta

Following the selection of the final list of 372 companies, of which 35 were “Banks” and 337 were classified as “Others”, we proceeded with the calculations of betas for each company, both during the first and second periods. The results (listed below) reveal that the majority of the companies under analysis (57.3%) recorded a lower beta during the second period, when compared to the first one. However, on a sectorial analysis, the data shows that “Banks” had the biggest nominal decrease, as 80.0% of these companies reduced its beta, while only 54.9% of “Others” has the same result.

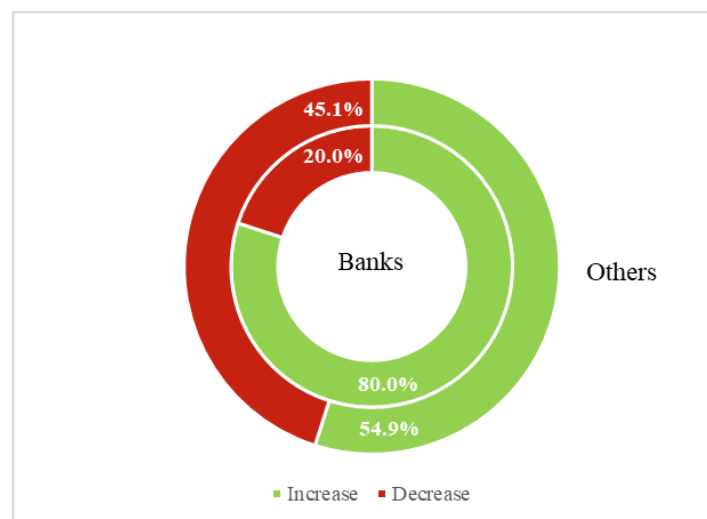


Figure 3 – Percentage of Increase and Decrease on Betas from First to Second Period, per sector

In order to complement the nominal analysis, we also computed the average beta for “Banks” and “Others”, as well as the average decrease / increase observed on both groups. The results point out a bigger decrease on “Banks” beta from the first to second periods, when compared to “Others”. While “Banks” went from an average beta of 1.642 to 1.237, recording a -0.405 reduction, “Others” beta increased by -0.042, coming from

1.044 to 1.086. In other words, the difference between “Banks” and “Others” fell drastically from 0.597 during the first period to 0.150 in the second.

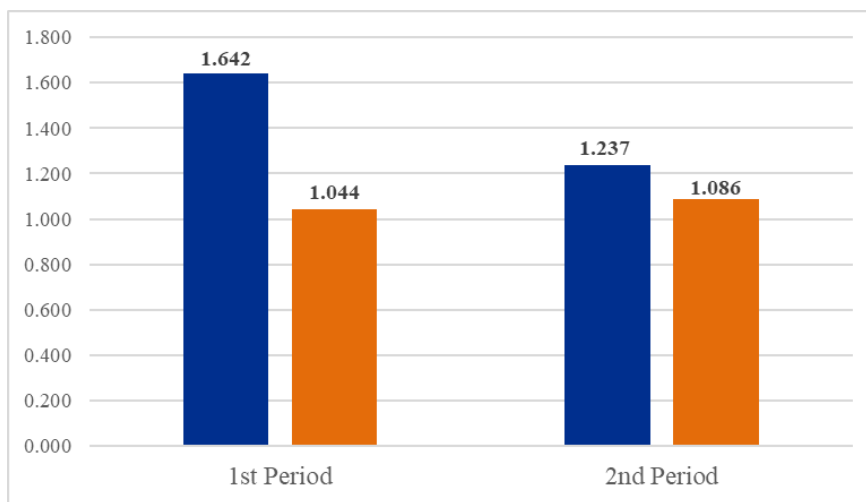


Figure 4 – Betas from First to Second Period, per Sector

Banks		
t-Test: Paired Two Sample for Means		
	<i>First Period</i>	<i>Second Period</i>
Mean	1.641658038	1.236589688
Variance	0.348486692	0.183218874
Observations	35	35
Pearson Correlation	0.055674896	
Hypothesized Mean Difference	0	
df	34	
t Stat	3.377013076	
P(T<=t) one-tail	0.000924228	
t Critical one-tail	1.690924255	
P(T<=t) two-tail	0.001848456	
t Critical two-tail	2.032244509	

Others		
t-Test: Paired Two Sample for Means		
	<i>First Period</i>	<i>Second Period</i>
Mean	1.044310087	0.961404915
Variance	0.291796885	0.090900423
Observations	337	337
Pearson Correlation	0.394379806	
Hypothesized Mean Difference	0	
df	336	
t Stat	3.018401015	
P(T<=t) one-tail	0.001367688	
t Critical one-tail	1.64940126	
P(T<=t) two-tail	0.002735375	
t Critical two-tail	1.967049384	

Table 1 – T-tests on "Banks" and "Others" Betas between First and Second periods, at 95% significance level

Banks		
t-Test: Paired Two Sample for Means		
	<i>First Period</i>	<i>Second Period</i>
Mean	1.641658038	1.236589688
Variance	0.348486692	0.183218874
Observations	35	35
Pearson Correlation	0.055674896	
Hypothesized Mean Difference	0	
df	34	
t Stat	3.377013076	
P(T<=t) one-tail	0.000924228	
t Critical one-tail	2.441149628	
P(T<=t) two-tail	0.001848456	
t Critical two-tail	2.728394367	

Others		
t-Test: Paired Two Sample for Means		
	<i>First Period</i>	<i>Second Period</i>
Mean	1.044310087	0.961404915
Variance	0.291796885	0.090900423
Observations	337	337
Pearson Correlation	0.394379806	
Hypothesized Mean Difference	0	
df	336	
t Stat	3.018401015	
P(T<=t) one-tail	0.001367688	
t Critical one-tail	2.337497151	
P(T<=t) two-tail	0.002735375	
t Critical two-tail	2.590540463	

Table 2 – T-tests on "Banks" and "Others" Betas between First and Second periods, at 99% significance level

With the purpose of verifying if these aforementioned differences are statistically significant, we ran T-tests for both “Banks” and “Others”, at 95% and 99% significance level (tables 1 and 2 above). Under these two scenarios, with the null hypothesis being there is a zero-mean difference between the results from the first and second periods, we verify that t-values are higher than each respective two-tail critical values. This allows us to rejected the null hypothesis, concluding there is a statistically significant difference between the average betas during the first and second periods, for both “Banks” and “Others”. Additionally, we validate these results via the probability, which is approximately zero on all scenarios, and hence below the 5% and 1% thresholds – depending on the significance level – that allow us to argue in favor of a statistically significant difference in these results.

95% Significance Level			99% Significance Level		
z-Test: Two Sample for Means			z-Test: Two Sample for Means		
	"Banks"	"Others"		"Banks"	"Others"
Mean	-0.40506835	-0.082905172	Mean	-0.40506835	-0.082905172
Known Variance	0.503569226	0.254237301	Known Variance	0.503569226	0.254237301
Observations	35	337	Observations	35	337
Hypothesized Mean Difference	0		Hypothesized Mean Difference	0	
z	-2.61807912		z	-2.61807912	
P(Z<=z) one-tail	0.004421315		P(Z<=z) one-tail	0.004421315	
z Critical one-tail	1.644853627		z Critical one-tail	2.326347874	
P(Z<=z) two-tail	0.00884263		P(Z<=z) two-tail	0.00884263	
z Critical two-tail	1.959963985		z Critical two-tail	2.575829304	

Table 3 – Z-tests on Beta difference between "Banks" and "Others", at 95% and 99% significance level

Additionally, we tested the statistical significance on beta difference between “Banks” and “Others”. Given the samples do not have the same number of observations, we ran Z-tests assuming each sample’s variance as the population variance, provided the samples are significative enough ($S > 30$). Both at a 95% and 99% significance level, we are able to prove the beta difference between “Banks” and “Others” – recorded from the first to the second periods – is statistically significant as Z-values are lower than negative two-tail critical values. Similarly, both probabilities are below the 5% and 1% thresholds, allowing us to conclude on the statistical significance of the results.

In order to control the size of the companies we used a weighted average beta for both samples. In this sense, we computed this beta for each stock, then clustering the results per sector. The first significant difference is that “Banks” weighted average beta revealed to be higher in the first period when compared to its simple average beta, reaching a value of 1.773. In contrast, “Others” measure was 1.083.

However, when we look to the second period, the difference between both groups under analysis gets reduced as much as showed by our simple average betas. “Banks” weighted average beta sank to 1.315, which is a slightly higher difference than recorded by its simple average beta. In contrast, “Others” weighted average beta derived a similar increase compared to the aforementioned one, as it came up by 0.040 to 1.123 – this value is actually higher than its simple average beta of 1.086. And these results still disclose another interesting perspective. Considering each company’s size, in order to compute a weighted average beta for both “Banks” and “others”, allows to conclude the beta difference between these narrowed significantly from the first to the second period, plummeting to only 0.192.

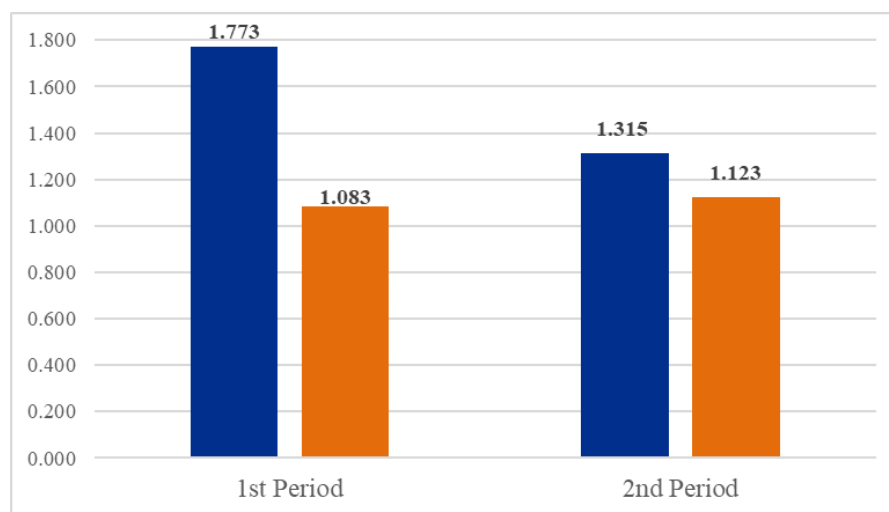


Figure 5 – Weighted Average Betas from First to Second Period, per Sector

Finally, we try a regional perspective, for which we decided to split each one of the 372 companies by country, and then regroup them by regions. Our subjective

categorization, shown by the below table, was both based on a geographical and economic framework analysis, being the later mainly justified by the European Sovereign Debt Crisis’s notion of peripheral countries.

Core	Nordic	Periphery
Austria	Danmark	Greece
Belgium	Finland	Ireland
France	Norway	Italy
Germany	Sweden	Portugal
Luxembourg		Spain
Netherlands		

Table 4 – Categorization of European countries by region

“Core” companies showed the best performance, both for “Banks” and “Others”. While 100% of the companies from the first group improved its beta from the first to the second period, 55.9% of the second obtained the same result, being both values above the aforementioned average. On the other hand, and as the below figure shows, “Peripheral” countries are positioned in the other extreme. Only 64.7% of these “Banks” obtained a better beta in the second period, while 57.1% of “Others” had the same result.

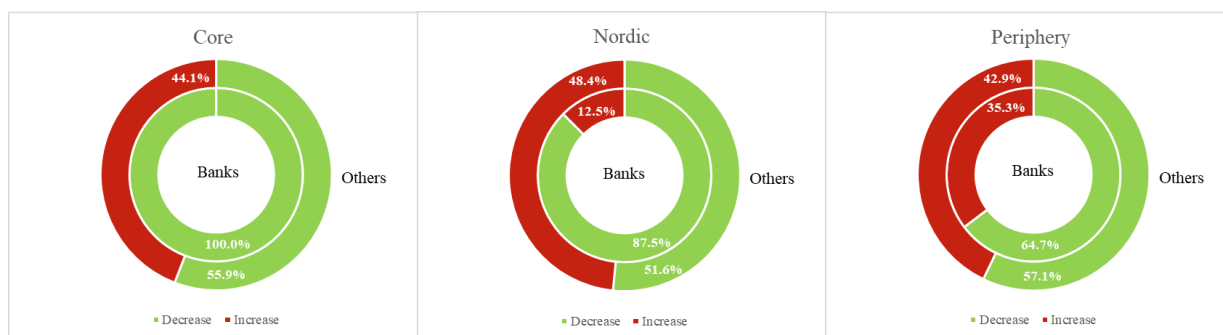


Figure 6 – Percentage of Increase and Decrease on Beta from First to Second Period, per sector and region

4.2 Volatility

As an additional study we extended our analysis to the volatility computed at the company’s level, as well as the sector level. Figure 6 (below) shows these results, on which we can verify that 74.3% of “Banks” stocks had a lower volatility in the second period, when compared to the first one – a significant improvement that contrasts with

“Others”. Only 53.1% of these companies got a better result during the second period of our analysis, which is far below comparing to “Banks” population.

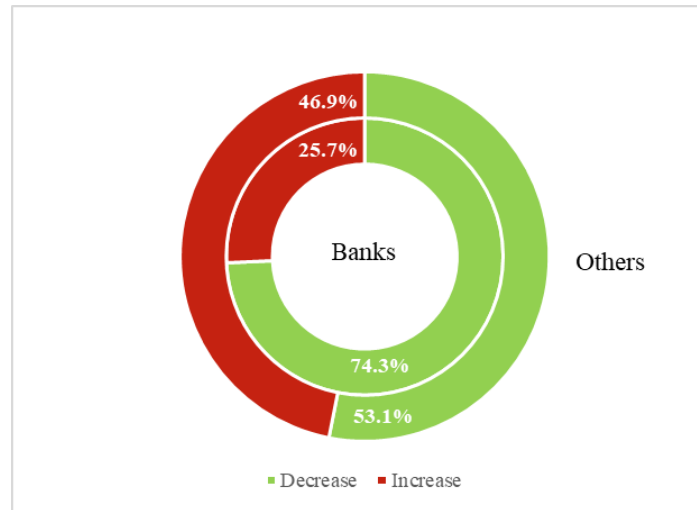


Figure 7 – Percentage of Increase and Decrease on Volatility from First to Second Period, per sector

In line with what was done while analyzing betas, we also decided to proceed with a regional comparison for volatility. In this sense, and as per the below figure, we were able to observe that “Core” countries were once again the best performers under this variable with 80.0% of “Banks” got a better volatility during the second period, while 53.7% of “Others” had deteriorated results in the same time frame. On the other hand, “Periphery Banks” were the worst in Europe, among the stocks included in our analysis, with only 64.7% improving its volatility from the first to the second period. However, and in what regards “Others”, “Nordic” companies were the worst performers given the majority deteriorated their results during the second period.

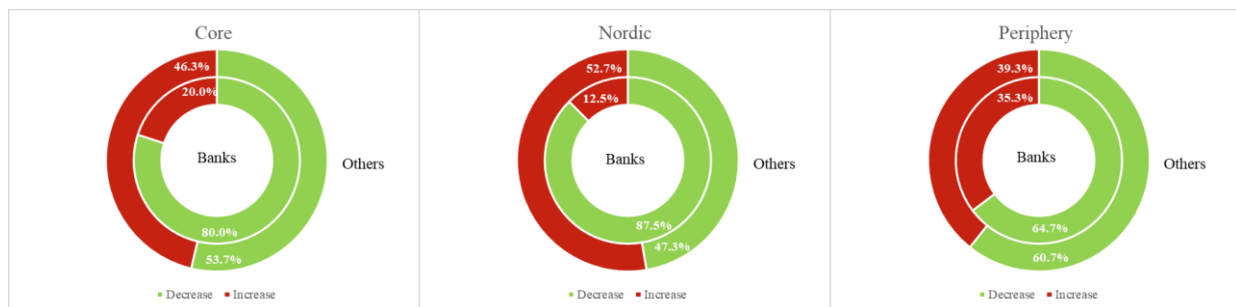


Figure 8 – Percentage of Increase and Decrease on Volatility from First to Second Period, per sector and region

5. Conclusions

This study aimed to analyze the implications of the SRM on European banks' risk, if any, as specified by the starting question. Among the Stoxx 600 index' companies, we proposed a comparison between "Banks" and "Others" throughout the designated time frame, in order to identify if the prior experienced a significant deviation from the later. And the results described above could not be clearer.

On a simple average assessment, "Banks" beta performed significantly better, as 81.8% revealed an improvement from the first to the second period, while only 60.8% of "Others" achieved the same result. This gets more interesting when considering each group spread between both periods, as "Banks" average beta was reduced by -0.405, while "Others" actually worsened by 0.042. More importantly, we were able to prove the statistical significance of these results, both through T-tests and Z-tests depending on the samples under analysis.

Furthermore, the weighted average beta showed an even more significant reduction of this risk measure among the "Banks" population. While the difference in the first period was as high as 0.690, this value sank to a measly 0.192 in the second period, less than a third of the first spread. Additionally, and now looking at volatility as a measure of total risk, "Banks" once again revealed a solid performance, as 74.3% showed a reduction of this gauge, while only 53.1% of "Others" recorded the same result.

Altogether, we are led to accept the null hypothesis: *"The creation and introduction of the SRM had a positive impact on European banks' risk"*. This set of results strongly support the cornerstone of the SRM, as a risk mitigation framework, in order to avoid future spillovers from financial crisis, but also from isolated banks' insolvencies. Protect the taxpayers, as well as the remaining financial system has proven to be essential to both security and solvency of States and individuals, hence why the constant appeals for a

further development of the European Banking Union, as previously described in this study.

And one can draw a strict relationship between the SRM and the reduction of risk among European banks. Considering that the SRM demands for shareholders' and bondholders' participation on banks' recapitalization during resolution proceeds, this directly avoids a higher participation rate from other banks' shareholders. Should the SRF be needed in order to inject liquidity into a troubled bank, truth is this amount will be as lower as higher is the wipe-out of its equity and bonds. Additionally, any lent amount will have to be repaid with interest, although throughout a significant time frame. More importantly, there is now a specific set of rules through which the banking system can guide itself, creating a certain predictability on what might happen under a bank insolvency scenario.

At the same time, depositors might also have to participate under the rules of the SRM. As deposits are only guaranteed up to one hundred thousand euros per bank account and individual, the remaining can be used to recapitalize its respective financial institution. And despite the different degree of participation, from shareholders, junior and senior bondholders, as well as depositors, truth is that every single contribution reduces the effort for the financial system as whole.

Should we attempt to describe it through an industry analogy, the SRM applies a ring fencing to a bank and its stakeholders, when imposing its resolution. In other words, the measures demanded by the Single Resolution Board and its regulation set a strict perimeter around the troubled bank, protecting its counterparts from most of the impact, and only allowing a straight aid from the SRF, which will ultimately be awarded with interest over many years.

Finally, we would also like to emphasize the regional analysis we carried out. In what regards the beta, "Core" banks were clearly the most positively affected, as 100.0%

of these reduced its beta from the first to the second period. On the other hand, and although still positive, “Periphery” banks revealed the lowest percentage of improvement, given that only 64.7% of “Banks” had a similar result. At the same time, “Periphery” banks were again the worst performers when analyzing volatility, while “Nordic” countries proved to have taken the most from the introduction of the SRM.

We argue these results are mainly a mirror of the poor financial and economic conditions that many “Peripheral” countries still face nowadays, in contrast with the more robust “Core” and “Nordic” economies. Although the SRM attempts to reduce the spillovers from the financial system to the sovereigns, the other way around is not as true. Countries like Portugal, Greece, and Italy still carry high debt piles, which directly affects the rating of its banks and, consequently, their cost of debt.

Parallely to the aforementioned conclusions, we highlight the fact that our study comprises some limitations. Firstly, we based ourselves on Stoxx 600 while using CAPM, which focuses on the market as a whole, i.e., all asset classes. Secondly, we had to apply some restrictions to our sample, which ends up translating into our results. Finally, we did not use any further variables, hence why we are not able to assess if any other factors played a roll on reducing European banks risk.

Nonetheless, and aiming further research on this subject, we would like to study the individual impact of SRM on each European bank, considering the financial stress that each sovereign might have caused during the periods under analysis. This would be best done over a five-year period, both prior and post the SRM agreement, and would imply a country by country assessment, as well as a focus on the events that occurred in the meanwhile. Additionally, a cost of debt analysis would be warranted, in order to verify how bondholders also reacted to the implementation of the SRM, bearing in mind the aforementioned national events.

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Appendix

Ticker	Name	Sector	Country	Region	1st Period Beta	2nd Period Beta	Beta Dif	Volatility	1st Period Volatility	2nd Period Volatility	Volatility Result	1st P. Average Weight	2nd P. Average Weight	1st Period Beta X 1st P. Average Weight	2nd Period Beta X 2nd P. Average Weight
ILIN Equity	3i Group PLC	Financial Services	Great Britain	Core	1.344472758	0.966615356	-0.3778574	0.299304686	0.237276514	0.08792787	Lower	0.085389951	0.08792787	0.085389951	0.084992939
AZAM Equity	AZA SpA	Utilities	Italy	Periphery	1.190884133	0.925260204	-0.2656293	0.474920573	0.38919763	0.025879211	Lower	0.025879211	0.025879211	0.025879211	0.025879211
AALB NY Equity	Aalberts Industries NV	Industrial Goods & Services	Netherlands	Core	1.277766288	0.982017058	-0.2957492	0.266407339	0.239097158	0.036546787	Lower	0.036546787	0.036546787	0.036546787	0.036546787
ARL GV Equity	Aareal Bank AG	Financial Services	Germany	Core	1.138915313	1.138915313	0	0.451254669	0.277187548	0.02556738	Lower	0.02556738	0.02556738	0.02556738	0.02556738
ABBN VX Equity	ABB Ltd	Industrial Goods & Services	Switzerland	Core	1.132450364	0.797881334	-0.3345691	0.226869865	0.271187548	0.054898984	Higher	0.054898984	0.054898984	0.054898984	0.054898984
ADLN Equity	Adelco Asset Management PLC	Financial Services	Great Britain	Core	1.303324179	1.509438424	0.206114245	0.317583337	0.157495456	0.073154541	Higher	0.073154541	0.073154541	0.073154541	0.073154541
ABE SQ Equity	Abertis Infraestructuras SA	Industrial Goods & Services	Spain	Periphery	0.990216188	0.862416449	-0.12779974	0.234031625	0.21495878	0.083225574	Lower	0.083225574	0.083225574	0.083225574	0.083225574
AC FP Equity	Accor SA	Travel & Leisure	France	Core	1.583561567	1.425631461	-0.15793011	0.327764369	0.305311628	0.0787959443	Lower	0.0787959443	0.0787959443	0.0787959443	0.0787959443
ACKB BB Equity	Actermans & van Haaren NV	Financial Services	Belgium	Core	0.884196267	0.56733569	-0.31686058	0.194119557	0.206907314	0.026217747	Lower	0.026217747	0.026217747	0.026217747	0.026217747
ACS SQ Equity	ACS Actividades de Construcción y Serv	Construction & Materials	Spain	Periphery	1.343248255	1.417507007	0.074258752	0.428541448	0.306526699	0.056405574	Lower	0.056405574	0.056405574	0.056405574	0.056405574
ATUN SW Equity	Actelion Ltd	Health Care	Switzerland	Core	0.9427270126	0.801710225	-0.1405599	0.246097908	0.381461135	0.0783836874	Higher	0.0783836874	0.0783836874	0.0783836874	0.0783836874
ADEN VX Equity	Adeco Group AG	Industrial Goods & Services	Switzerland	Core	1.646810115	1.138585683	-0.50822443	0.222500133	0.100659167	0.093978148	Lower	0.093978148	0.093978148	0.093978148	0.093978148
ADS GV Equity	adidas AG	Personal & Household Goods	Germany	Core	0.837829756	0.940656935	0.10282179	0.192344087	0.292341137	0.24945882	Higher	0.24945882	0.24945882	0.24945882	0.24945882
ADM LN Equity	Admiral Group PLC	Insurance	Great Britain	Core	0.930052021	0.426619717	-0.5033823	0.340019631	0.214556052	0.053046426	Lower	0.053046426	0.053046426	0.053046426	0.053046426
AGN NA Equity	Aegion NV	Insurance	Netherlands	Core	1.890353347	1.395087996	-0.49526535	0.381689438	0.270418621	0.297949494	Lower	0.297949494	0.297949494	0.297949494	0.297949494
ADP FP Equity	Aéroports de Paris	Industrial Goods & Services	France	Core	0.709952201	0.74321005	0.033257849	0.181079647	0.189188749	0.063898705	Higher	0.063898705	0.063898705	0.063898705	0.063898705
AGS BB Equity	Ageas	Insurance	Belgium	Core	1.908613824	0.853768749	-1.05484508	0.364293	0.237375956	0.086054525	Lower	0.086054525	0.086054525	0.086054525	0.086054525
AGK LN Equity	Aggreko PLC	Industrial Goods & Services	Great Britain	Core	0.713022483	0.908486097	0.195463614	0.156485894	0.371249959	0.113626869	Higher	0.113626869	0.113626869	0.113626869	0.113626869
AF FP Equity	Air France-KLM	Travel & Leisure	France	Core	1.8215279	0.805240197	-1.0162877	0.156346099	0.41142186	0.02886677	Lower	0.02886677	0.02886677	0.02886677	0.02886677
AI FP Equity	Air Liquide SA	Chemicals	France	Core	0.80532658	0.92801033	0.122474375	0.156346099	0.208406501	0.52476426	Higher	0.52476426	0.52476426	0.52476426	0.52476426
AIR FP Equity	Airbus SE	Industrial Goods & Services	France	Core	0.767211445	1.31377687	0.550166242	0.307088363	0.299811489	0.250133443	Higher	0.250133443	0.250133443	0.250133443	0.250133443
AKA NO Equity	Akator ASA	Oil & Gas	Norway	Nordic	1.216494951	1.36187228	0.14537733	0.090228829	0.236222178	0.055390803	Higher	0.055390803	0.055390803	0.055390803	0.055390803
AKZA NA Equity	Akzo Nobel NV	Chemicals	Netherlands	Core	1.23563974	1.116974307	-0.11866543	0.278662636	0.260490914	0.187163213	Lower	0.187163213	0.187163213	0.187163213	0.187163213
ALFA SS Equity	Alfa Laval AB	Industrial Goods & Services	Sweden	Nordic	1.201307816	1.091302186	-0.11000563	0.251931688	0.258718338	0.088751	Higher	0.088751	0.088751	0.088751	0.088751
ALV GV Equity	Alliant SE	Insurance	Germany	Core	1.717243364	1.18413552	-0.54117884	0.304650883	0.24760215	0.77566482	Higher	0.77566482	0.77566482	0.77566482	0.77566482
ALO FP Equity	Alltium SA	Industrial Goods & Services	France	Core	0.87868127	0.893312078	0.013949951	0.338485441	0.205613111	0.107961131	Lower	0.107961131	0.107961131	0.107961131	0.107961131
AMS SQ Equity	Amadeus IT Group SA	Industrial Goods & Services	Spain	Periphery	0.87868127	0.893312078	0.013949951	0.338485441	0.205613111	0.114711787	Lower	0.114711787	0.114711787	0.114711787	0.114711787
AMFW LN Equity	Amer Foster Wheeler PLC	Oil & Gas	Great Britain	Core	0.943360438	1.168522633	0.225157196	0.242323735	0.290751383	0.073695957	Higher	0.073695957	0.073695957	0.073695957	0.073695957
AMEAS FH Equity	Amer Sports Oyj	Personal & Household Goods	Finland	Nordic	0.808466533	1.012919129	0.204452576	0.253562102	0.2745217	0.0245489754	Higher	0.0245489754	0.0245489754	0.0245489754	0.0245489754
AMS SE Equity	ams AG	Technology	Switzerland	Core	1.543730297	1.432500051	-0.11123025	0.405687837	0.551884541	0.030033075	Higher	0.030033075	0.030033075	0.030033075	0.030033075
ANDR AV Equity	ANDRITZ AG	Industrial Goods & Services	Austria	Core	0.772506756	0.928472225	0.155965469	0.249456398	0.225495543	0.053367934	Higher	0.053367934	0.053367934	0.053367934	0.053367934
AAL LN Equity	Anglo American PLC	Basic Resources	Great Britain	Core	1.578388752	0.886416324	-0.69197243	0.352739785	0.592464687	0.192964852	Higher	0.192964852	0.192964852	0.192964852	0.192964852
AMU BB Equity	Anheuser-Busch InBev SA/NV	Food & Beverage	Belgium	Core	0.37441895	1.032208364	0.657789414	0.171160695	0.46050115	0.671909557	Higher	0.671909557	0.671909557	0.671909557	0.671909557
ANTO LN Equity	Antofagasta PLC	Basic Resources	Great Britain	Core	1.654898474	0.89653861	-0.75835986	0.411760599	0.650950508	0.09155393	Higher	0.09155393	0.09155393	0.09155393	0.09155393
MAERSK DC Equity	AP Moller - Maersk A/S	Industrial Goods & Services	Denmark	Nordic	1.23920376	1.216382868	-0.02291549	0.58939182	0.669383549	0.140315148	Higher	0.140315148	0.140315148	0.140315148	0.140315148
MT NA Equity	ArcelorMittal	Basic Resources	Netherlands	Core	2.427859314	1.849792079	-0.57806903	0.630113969	0.669486707	0.261511033	Higher	0.261511033	0.261511033	0.261511033	0.261511033
ARE FP Equity	Ariema SA	Chemicals	France	Core	1.397463856	1.407198668	0.009710012	0.331486756	0.290050957	0.05331164	Higher	0.05331164	0.05331164	0.05331164	0.05331164
ARVN VX Equity	Arysta AG	Food & Beverage	Switzerland	Core	0.650017728	0.917930791	0.267913062	0.191946113	0.452339814	0.066145721	Higher	0.066145721	0.066145721	0.066145721	0.066145721
ASHM LN Equity	Ashtore Group PLC	Financial Services	Great Britain	Core	1.349001922	1.006701758	-0.34230016	0.358122183	0.354751496	0.028907475	Lower	0.028907475	0.028907475	0.028907475	0.028907475
AHT LN Equity	Ashtead Group PLC	Industrial Goods & Services	Great Britain	Core	1.424290212	0.749558334	-0.67473188	0.382308742	0.313476198	0.021905386	Lower	0.021905386	0.021905386	0.021905386	0.021905386
ASM NA Equity	ASM International NV	Technology	Netherlands	Core	0.937376896	1.55444319	0.6170067423	0.297785568	0.280925449	0.025986197	Lower	0.025986197	0.025986197	0.025986197	0.025986197
ASML NA Equity	ASML Holding NV	Technology	Netherlands	Core	0.896810948	1.21646843	0.319657488	0.233884463	0.288411031	0.321168934	Higher	0.321168934	0.321168934	0.321168934	0.321168934
ASSA SS Equity	Assa Abloy AB	Construction & Materials	Sweden	Nordic	1.042805099	1.130430997	0.087624898	0.204791	0.256942682	0.151498033	Higher	0.151498033	0.151498033	0.151498033	0.151498033
G IM Equity	Assicurazioni Generali SpA	Insurance	Italy	Periphery	1.334300095	1.25196424	-0.08930367	0.334423952	0.265626286	0.307915213	Lower	0.307915213	0.307915213	0.307915213	0.307915213
ABF LN Equity	Associated British Foods PLC	Food & Beverage	Great Britain	Core	0.626833205	0.624257059	0.000000000	0.197423854	0.171927647	0.049756745	Higher	0.049756745	0.049756745	0.049756745	0.049756745
AZLN LN Equity	Astracenera PLC	Health Care	Great Britain	Core	0.635639241	0.777521998	0.141882757	0.152294407	0.266565333	0.388627213	Higher	0.388627213	0.388627213	0.388627213	0.388627213
ATLM Equity	Atlanta SpA	Industrial Goods & Services	Italy	Periphery	1.289846752	0.675012396	-0.614664356	0.271112973	0.190638185	0.0721187	Lower	0.0721187	0.0721187	0.0721187	0.0721187
ATCOA SS Equity	Atlas Copco AB	Industrial Goods & Services	Sweden	Nordic	1.192321972	1.138234698	-0.0540872	0.252871623	0.270110503	0.14394508	Higher	0.14394508	0.14394508	0.14394508	0.14394508
ATO FP Equity	Atos SE	Technology	France	Core	0.952321169	0.78795352	-0.1642765	0.237530133	0.2277702	0.046653164	Lower	0.046653164	0.046653164	0.046653164	0.046653164
NDA GV Equity	Aurubis AG	Basic Resources	Germany	Core	0.99638223	0.469663586	-0.52671864	0.277687433	0.277485378	0	Lower	0	0	0	0.027399349

Appendix - Summary Table of Results (1/12)

Ticker	Name	Sector	Country	Region	1st Period Beta	2nd Period Beta	Beta Result	Beta Dif	1st Period Volatility	2nd Period Volatility	Volatility Result	1st P. Average Weight	2nd P. Average Weight	X.1st P. Average Weight	X.2nd P. Average Weight
AV LN Equity	AVEVA PLC	Technology	Great Britain	Core	0.162267319	0.178192802	Lower	-0.13035442	0.246349309	0.3949313442	Higher	0.028770491	0.017102813	0.025972699	0.01337291
AV LN Equity	Aniva PLC	Insurance	Great Britain	Core	0.973531845	1.05092155	Lower	-0.63643029	0.33064838	0.244175246	Lower	0.236184866	0.326174422	0.365176429	0.01764295
CS FP Equity	AXA SA	Insurance	France	Core	2.079695174	1.318488062	Lower	-0.76120611	0.397614642	0.237947094	Lower	0.598837033	0.941136594	0.790878567	0.020861232
SPR FP Equity	Axel Springer SE	Media	Germany	Core	0.865659164	0.776889626	Lower	-0.08875954	0.251460878	0.235201888	Lower	0.025925459	0.022442611	0.020861232	0.041343448
AZM LN Equity	Azmut Holding SPA	Food & Beverage	Italy	Periphery	1.354093181	1.533303745	Higher	0.180311564	0.326774565	0.389875455	Higher	0.02838886	0.028100902	0.035756373	0.028143448
BAB LN Equity	Babcock International Group PLC	Industrial Goods & Services	Great Britain	Core	0.449424381	0.543037146	Higher	0.093613264	0.172538199	0.221884947	Higher	0.072117279	0.044903508	0.032437294	0.041343448
BAV LN Equity	BAE Systems PLC	Industrial Goods & Services	Great Britain	Core	0.938990078	0.525498611	Lower	-0.511390547	0.239341763	0.196889277	Lower	0.274250361	0.251458233	0.144116812	0.014535551
BBY LN Equity	Balfour Beatty PLC	Construction & Materials	Great Britain	Core	0.988523264	0.508815278	Lower	-0.47970709	0.346892784	0.273620978	Lower	0.040019557	0.028583164	0.039615585	0.014535551
BALN VX Equity	Baloise Holding AG	Insurance	Switzerland	Core	1.082926009	0.717115741	Lower	-0.37213387	0.214643861	0.197183267	Lower	0.059252623	0.072261557	0.064623164	0.051822892
BPSO IM Equity	Banca Popolare di Sondrio SCPA	Banks	Italy	Periphery	0.589152743	0.989253502	Higher	0.400100759	0.327673631	0.314698866	Higher	0.02229331	0.016421425	0.022052745	0.022052745
BVA LN Equity	Banco Bilbao Vizcaya Argentaria SA	Banks	Spain	Periphery	1.507103984	1.24768254	Higher	-0.25942144	0.35296035	0.329560794	Lower	0.626077951	0.943561559	0.732881483	0.0732881483
BAMI IM Equity	Banco BPM SPA	Banks	Italy	Periphery	1.76716842	1.283012941	Lower	-0.4857039	0.561955445	0.624142711	Higher	0	0.0493548	0.087294666	0.063322847
BCP PL Equity	Banco Comercial Portugues SA	Banks	Portugal	Periphery	0.735961283	1.571820567	Higher	0.83859284	0.557710261	0.618347919	Higher	0.021100029	0.029812396	0.015528804	0.046859737
SAB SQ Equity	Banco de Sabadell SA	Banks	Spain	Periphery	1.271623799	1.321547716	Higher	0.04923398	0.525462982	0.413584525	Lower	0.09290525	0.10876757	0.14443265	0.14443265
POP SQ Equity	Banco Popular Espanol SA	Banks	Spain	Periphery	1.638225299	1.4197816	Lower	-0.718841	0.527653062	0.46850983	Lower	0.066899787	0.077490557	0.109596743	0.110026766
SAN SQ Equity	Banco Santander SA	Banks	Spain	Periphery	1.402322226	1.34118279	Lower	-0.0650494	0.354827756	0.371705497	Higher	1.000948049	0.941675918	1.407565403	1.262959535
BKR ID Equity	Bank of Ireland	Banks	Ireland	Periphery	2.066354932	0.824077284	Lower	-1.24227765	0.563744885	0.485995537	Lower	0.04169781	0.098816262	0.086162476	0.081432237
BKIA SQ Equity	Bankia SA	Banks	Spain	Periphery	2.443309557	1.271220612	Lower	-1.17208895	1.904770925	0.377346486	Lower	0.033273386	0.055608262	0.081297183	0.070690369
BKT SQ Equity	Bankinter SA	Banks	Spain	Periphery	1.625073036	0.83463233	Lower	-0.7904071	0.47665644	0.240167232	Lower	0.024222353	0.056923131	0.039363093	0.047509886
BARC LN Equity	Barclays PLC	Banks	Great Britain	Core	2.075459213	1.094749371	Lower	-0.98070984	0.44482585	0.313632746	Lower	0.574685754	0.613806311	1.927368443	0.671964073
BOVE LN Equity	Barrat Developments PLC	Personal & Household Goods	Great Britain	Core	1.279796815	0.405573998	Lower	-0.87422282	0.377832976	0.320299505	Lower	0.039852492	0.091046393	0.051003092	0.03692605
BARM SE Equity	Barrat Callebaut AG	Food & Beverage	Switzerland	Core	0.413170053	0.554252662	Higher	0.141082609	0.159154178	0.232875807	Higher	0.027491018	0.031255262	0.011358465	0.017323312
BAS FY Equity	BASF SE	Chemicals	Germany	Core	1.381309127	1.125386315	Lower	-0.15592291	0.290567857	0.236035022	Lower	1.06454549	0.921098459	1.363992887	1.06591508
BANV FY Equity	Bayer AG	Chemicals	Germany	Core	1.059684368	1.139830034	Higher	0.040136466	0.235444797	0.259020539	Higher	0.976012705	1.420268279	1.073257114	1.370861184
BMW FY Equity	Bayerische Motoren Werke AG	Automobiles & Parts	Germany	Core	1.748775303	1.289556256	Lower	-0.45719105	0.326244833	0.299535797	Lower	0.38618523	0.369781475	0.674578821	0.476854015
BION SE Equity	BB Biotech AG	Health Care	Switzerland	Core	0.554580655	1.416233906	Higher	0.861653251	0.206103897	0.276432839	Higher	0	0.036264362	0.020111514	0.051358819
BBA LN Equity	BBA Aviation PLC	Industrial Goods & Services	Great Britain	Core	0.848614455	0.64167627	Lower	-0.20693782	0.250505613	0.228441129	Lower	0.026393	0.029892639	0.022397484	0.019181411
BEZ LN Equity	Beazley PLC	Health Care	Switzerland	Core	0.614803379	0.220772508	Lower	-0.39403601	0.164940873	0.164940873	Lower	0	0.031607346	0.019432303	0.006978033
BEL FY Equity	Beiersdorf AG	Personal & Household Goods	Germany	Core	0.512740715	0.807680712	Higher	0.294939987	0.143733039	0.20269042	Higher	0.102499393	0.104371639	0.052556612	0.08429896
BELV LN Equity	Belway PLC	Industrial Goods & Services	Great Britain	Core	1.093928689	0.126776042	Lower	-0.96715265	0.294086095	0.319617832	Higher	0.028692811	0.048774262	0.031387889	0.006138408
BRSN LN Equity	Berendsen PLC	Real Estate	Great Britain	Core	0.626095141	0.319775939	Lower	-0.3063193	0.198814531	0.258098342	Higher	0.028831	0.031563787	0.018050949	0.010093336
BKG LN Equity	Berkeley Group Holdings PLC	Personal & Household Goods	Great Britain	Core	0.8781396	0.207491223	Lower	-0.63032274	0.226137112	0.283106145	Higher	0.04635197	0.065799803	0.03919154	0.04022216
BLT LN Equity	BHP Billiton PLC	Basic Resources	Great Britain	Core	1.528766761	1.12253757	Lower	-0.406229	0.303630382	0.429326252	Higher	0.0521671292	0.407915607	1.395261489	0.45790067
EN FP Equity	Bliffinger SE	Industrial Goods & Services	Germany	Core	1.106439575	1.061995438	Lower	-0.04444414	0.231317905	0.402803043	Higher	0.023576967	0.057666597	0.025038632	0.025038632
BILL SS Equity	BillerdKorsnas AB	Basic Resources	Sweden	Nordic	0.850074641	0.990861509	Higher	0.140768689	0.282950618	0.262801377	Lower	0	0.034012115	0.028912836	0.033701295
BNP FP Equity	BNP Paribas SA	Banks	France	Core	2.271070037	1.124043395	Lower	-1.14702664	0.440934646	0.302573844	Lower	0.724964672	0.754779984	1.646445545	0.848405455
BOL SS Equity	Boliden AB	Basic Resources	Sweden	Nordic	1.871325009	1.536574545	Lower	-0.33475046	0.369030374	0.38940814	Higher	0.058313656	0.061162384	0.109123802	0.095981484
BOL FP Equity	Bollors SA	Industrial Goods & Services	France	Core	0.645709372	1.049420254	Higher	0.403733582	0.223513654	0.273802933	Higher	0.033875067	0.042060738	0.021873448	0.044140345
BME SQ Equity	Bolsas y Mercados Espanoles SHMSF SA	Financial Services	Spain	Periphery	0.719865943	0.981882484	Higher	0.26489654	0.244056235	0.247323243	Higher	0.035054262	0.032412918	0.017965554	0.031823676
BOK LN Equity	Booker Group PLC	Retail	Great Britain	Core	0.387458364	0.571281237	Higher	0.183822873	0.204924424	0.240715383	Higher	0.032062569	0.044970889	0.01242291	0.027347729
BOKA NA Equity	Boskalis Westminster	Construction & Materials	Netherlands	Core	1.384144635	0.75602908	Lower	-0.65884173	0.277234308	0.249570523	Lower	0.038571016	0.040964098	0.063387865	0.029723669
BP LN Equity	Bouygues SA	Construction & Materials	France	Core	1.525518707	0.960032887	Lower	-0.56548582	0.32210398	0.256239878	Lower	0.106700344	0.116377337	0.16277371	0.111776786
BP LN Equity	BP PLC	Oil & Gas	Great Britain	Core	0.770745262	0.817351587	Higher	0.046066325	0.196711923	0.285722915	Higher	1.841689850	1.290489508	4.14947728	1.054783648
BPE IM Equity	BPER Banca	Banks	Italy	Periphery	1.272959684	1.576730564	Higher	-0.15122912	0.590719948	0.516351686	Lower	0.031597262	0.03602541	0.054598799	0.056766307
BNR FY Equity	Brenntag AG	Chemicals	Germany	Core	0.713568074	0.924245937	Higher	0.210677863	0.214367946	0.243572968	Higher	0.08025518	0.099166639	0.057480178	0.091654363
BATS LN Equity	British American Tobacco PLC	Personal & Household Goods	Great Britain	Core	0.51371991	0.641828786	Higher	0.12408876	0.14966783	0.209579333	Higher	1.41326654	1.279195311	0.72602316	0.82204374
BAND LN Equity	British Land Co PLC/The	Real Estate	Great Britain	Core	0.814300596	0.67160885	Lower	-0.14289175	0.202851841	0.218504338	Higher	0.108100918	0.126161787	0.088026642	0.086731373
BVC LN Equity	Britvic PLC	Real Estate	Great Britain	Core	0.440354953	0.612433196	Lower	-0.172078243	0.240252642	0.187094959	Lower	0.021171197	0.029269459	0.009322841	0.017925588
BT LN Equity	BT Group PLC	Telecommunications	Great Britain	Core	0.768325394	0.638331005	Lower	-0.12979439	0.184883424	0.261741483	Higher	0.433680483	0.609646818	0.333120961	0.389157336
BTG LN Equity	BTG PLC	Health Care	Great Britain	Core	0.509942322	0.315942629	Lower	-0.19399969	0.251790403	0.285244814	Higher	0.025793523	0.040407285	0.013152699	0.01278711

Appendix - Summary Table of Results (2/12)

1st Period Beta	2nd Period Beta	Beta Dif	1st Period Volatility	2nd Period Volatility	Volatility Result	1st P. Average Weight	2nd P. Average Weight	1st Period Beta X 1st P. Average Weight	2nd Period Beta X 2nd P. Average Weight
BNZLN Equity	0.433449254	0.58078908	0.178344366	0.197188566	Higher	0.077645377	0.112082885	0.033655331	0.065095731
BRBY LN Equity	1.255727018	0.653389833	0.371057791	0.252259058	Lower	0.13339918	0.112082885	0.165001501	0.071692118
BVI FP Equity	0.461529187	0.693252479	0.182244437	0.181795197	Lower	0.07223782	0.063934541	0.03339862	0.044327779
GCC ID Equity	0.829621264	0.465108802	0.240827711	0.205939065	Lower	0.02323036	0.0163365	0.01927584	0.00759825
CNE LN Equity	1.164174268	0.719218804	0.4449546	0.412915759	Lower	0.05028534	0.01794333	0.058538843	0.012905183
CABK SO Equity	1.110836488	1.054162025	0.354470118	0.36783584	Higher	0.050536902	0.10827841	0.056138234	0.110248404
CAP FP Equity	1.243699358	1.117697124	0.287926253	0.268604857	Lower	0.09540477	0.174533328	0.118654852	0.195075399
CP LN Equity	0.594400773	0.532641951	0.176081338	0.379989907	Higher	0.1111780426	0.116742984	0.066446765	0.06218165
CAPC LN Equity	0.657707704	0.4804991	0.203454973	0.270111821	Higher	0.03622912	0.042581393	0.022114048	0.020460321
CLLN LN Equity	1.073768495	0.447350643	0.30134664	0.21673015	Lower	0.02810049	0.022346418	0.030236636	0.009996885
CARLB DC Equity	1.288147232	0.91496024	0.328990987	0.241063255	Lower	0.126402787	0.110602705	0.1628254	0.10119712
CCL LN Equity	0.827339554	0.440811444	0.256243637	0.235436112	Lower	0.088313098	0.110862328	0.073066491	0.048869383
CA FP Equity	1.183223379	1.180851443	0.02237194	0.295717596	Lower	0.20724341	0.195414902	0.245115248	0.230759569
CO FP Equity	1.074601842	1.110086059	0.035484228	0.219643917	Higher	0.07170623	0.043038889	0.077119471	0.047716857
CAS T SO Equity	0.619018166	0.709585858	0.090567692	0.118899963	Higher	0.05668746	0.035668115	0.020001383	0.010309959
CEY LN Equity	0.896602292	-0.3801373	-1.27673402	0.593997358	Lower	0.02658721	0.02658721	0.023838172	-0.01010665
CNA LN Equity	0.341106765	0.706179885	0.36507312	0.140160203	Higher	0.374884197	0.209367557	0.127875535	0.147851156
CNE LN Equity	0.696493119	0.737455663	0.040962443	0.247215336	Higher	0.05026163	0.038677525	0.035007834	0.028522956
CEZ OK Equity	1.937656522	2.14747182	0.20984761	0.400197245	Higher	0.05324782	0	0.103175885	0.114348164
CGG SA Equity	0.412768529	0.629173157	0.216404228	0.153811943	Higher	0.056262347	0.087151525	0.024628349	0.05483334
LSN VX Equity	0.820158161	0.645600407	0.181467967	0.237864087	Higher	0.04667946	0.0657023	0.011199962	0.042082889
CHR DC Equity	1.62271483	0.838506428	-0.7842084	0.41212234	Lower	0.026246689	0.061470754	0.081714811	0.051543622
Christian Dior SE	1.378509977	0.826259833	-0.55259114	0.28588263	Lower	0.115017672	0.114186934	0.15859223	0.094348077
SGO FP Equity	1.735325068	1.079484048	-0.65584102	0.23916987	Lower	0.25622639	0.264583357	0.444681629	0.28561373
CFR VX Equity	1.36412522	0.873417432	-0.49070779	0.306909471	Lower	0.508756934	0.455832016	0.694089165	0.98131629
MI FP Equity	1.65908891	0.994640047	-0.66526884	0.310715769	Lower	0.201411639	0.221898475	0.334324971	0.22070911
POM FP Equity	1.649249728	0.94674245	-0.70250728	0.380112069	Lower	0	0.02688375	0.044338017	0.025451987
CLN VX Equity	1.62271483	0.838506428	-0.7842084	0.41212234	Lower	0.050358652	0.061470754	0.081714811	0.051543622
CBG LN Equity	1.066269766	0.61320574	-0.45306043	0.248474534	Lower	0.026246689	0.034898967	0.02798605	0.021394728
CNP FP Equity	1.333441731	1.271389084	-0.06205265	0.35503879	Lower	0.029176689	0.028997443	0.038905414	0.036867032
COB LN Equity	0.7001346	0.563683277	-0.13645132	0.22990267	Higher	0.053840131	0.051077164	0.037695339	0.028791343
COFB BB Equity	0.557388175	0.58589251	0.028504356	0.140696907	Higher	0.024053934	0.026483295	0.013407379	0.015156365
COLB DC Equity	1.89913228	0.896502708	-0.70658948	0.17772859	Higher	0.067647475	0.106479623	0.1284715	0.09545927
COLB BB Equity	0.540818337	0.387540666	-0.15327767	0.22110785	Lower	0.04760082	0.037174066	0.025743396	0.014046462
CBK GY Equity	1.576400461	1.269665554	-0.30673511	0.541140345	Lower	0.120592795	0.121118889	0.190109632	0.157780432
CPG LN Equity	0.691947025	0.462835996	-0.22911103	0.15251966	Higher	0.289382066	0.346286607	0.200237059	0.160273906
CON GY Equity	1.85928491	1.10031163	-0.75897328	0.343436342	Lower	0.2711382	0.2711382	0.24417266	0.304911559
ACA FP Equity	2.304278407	1.43450588	-0.86962753	0.517549072	Lower	0.116720721	0.164967213	0.268957038	0.236670357
CSGN VX Equity	1.57454121	1.494240206	-0.080301	0.352469794	Higher	0.453353607	0.381298803	0.713823596	0.569752002
CRH ID Equity	1.235668221	1.027651103	-0.20801712	0.25518526	Lower	0.199808279	0.283847803	0.24689674	0.291695608
CRDLN Equity	0.687434467	0.540076938	-0.12735753	0.26379623	Lower	0.068747656	0.069894907	0.04588055	0.037474845
DMGT LN Equity	0.939454996	0.56495006	-0.37450499	0.248753073	Higher	0.034980068	0.036668902	0.032868774	0.020716096
DAI GY Equity	1.928650415	1.22377384	-0.70487658	0.350790671	Lower	0.79304098	0.929835672	1.406572652	1.137908071
BN FP Equity	0.650968834	0.94860458	0.297721625	0.175979613	Higher	0.567761623	0.491336492	0.369595122	0.466126242
DANSKE DC Equity	0.683814752	0.601907356	-0.0819074	0.279295056	Lower	0.146641902	0.100275806	0.100275806	0.100275806
AM FP Equity	0.606964877	0.690117991	0.083152314	0.208342732	Higher	0	0.027696795	0.016810882	0.01911404
DSY FP Equity	0.950888652	0.90573955	-0.04691431	0.188830282	Higher	0.08997523	0.12056059	0.055343238	0.02553847
CFR IMI Equity	0.661263453	0.946592052	0.256168599	0.121382477	Higher	0.029665279	0.023822852	0.020481901	0.109550523
DCC LN Equity	0.661263453	0.946592052	-0.19339855	0.218906561	Higher	0.041181867	0.037192388	0.083704098	0.027192388
DL NA Equity	1.561804607	1.557745552	-0.00405905	0.341273504	Higher	0.033781371	0.046002007	0.056262781	0.056262781

Appendix - Summary Table of Results (3/12)

Ticker	Name	Sector	Country	Region	1st Period Beta	2nd Period Beta	Beta Diff	1st Period Volatility	2nd Period Volatility	Volatility Result	1st P. Average Weight	2nd P. Average Weight	1st Period Beta X 1st P. Average Weight	2nd Period Beta X 2nd P. Average Weight
DUN LN Equity	Derwent London PLC	Real Estate	Great Britain	Core	0.15298177	0.65206725	-0.26323095	0.216380949	0.230722935	Higher	0.04982689	0.05837393	0.040257275	0.038059464
DBK GY Equity	Deutsche Bank AG	Banks	Germany	Core	1.797838557	1.598466101	-0.19937246	0.410670811	0.424017152	Higher	0.554450639	0.996812737	0.584163865	0.584163865
DB1 GY Equity	Deutsche Boerse AG	Financial Services	Germany	Core	1.084094297	0.978021132	-0.10607377	0.307944064	0.290198886	Lower	0.160277887	0.189239804	0.173712871	0.185085298
DEQ GY Equity	Deutsche EuroShop AG	Travel & Leisure	Germany	Core	0.95325939	0.693448059	-0.00187788	0.209180449	0.190062843	Lower	0.023870275	0.016543386	0.016543386	0.016552528
LHA GY Equity	Deutsche Lufthansa AG	Travel & Leisure	Germany	Core	1.62633056	1.021809343	-0.20176222	0.298176423	0.346751699	Higher	0.050515705	0.038964475	0.064121128	0.039814265
DPW GY Equity	Deutsche Post AG	Industrial Goods & Services	Germany	Core	1.063983305	1.160238389	0.096255085	0.219861949	0.239055819	Higher	0.255080001	0.342631066	0.274401001	0.349753376
DTE GY Equity	Deutsche Telekom AG	Telecommunications	Germany	Core	0.715533959	1.039739276	0.324205316	0.221095775	0.232353918	Higher	0.498228197	0.646396574	0.356499194	0.672083905
DWNI GY Equity	Deutsche Wohnen AG	Real Estate	Germany	Core	0.772429855	0.660321018	-0.11182884	0.242832938	0.299663847	Lower	0.104585328	0.027748539	0.027748539	0.06905989
DGE LN Equity	Diageo PLC	Food & Beverage	Great Britain	Core	0.95068515	0.668098745	-0.07741323	0.156634244	0.214668923	Higher	0.825146148	0.545243594	0.545243594	0.551279106
DIG GY Equity	Dialog Semiconductor PLC	Technology	Germany	Core	0.963258298	1.249206197	0.285947899	0.405083565	0.3983569014	Higher	0	0.03682069	0.035467835	0.0495926634
WIN GY Equity	Diobold Nixdorf AG	Technology	Germany	Core	1.285500593	0.70788267	-0.57761792	0.308840217	0.294315157	Lower	0	0.026118876	0.026118876	0.01492934
DIA SQ Equity	Distribuidora Internacional de Alimentac	Retail	Spain	Periphery	0.658847759	1.048430082	0.389591743	0.236133092	0.279509382	Higher	0.050561328	0.045141885	0.043424882	0.04120813
DC/ LN Equity	Dixons Carphone PLC	Retail	Great Britain	Core	0.663408696	0.564481865	-0.09892701	0.537584038	0.235083832	Lower	0.071075892	0.047152099	0.047152099	0.040120813
DNB NO Equity	DNB ASA	Banks	Norway	Nordic	1.76799852	1.072348732	-0.3045112	0.292017482	0.276861281	Lower	0.163090975	0.155144918	0.224555334	0.166369456
DOM LN Equity	Dominio's Piza Group PLC	Utilities	Great Britain	Core	0.897052072	0.444809148	-0.45224392	0.17291222	0.266659922	Lower	0.029004375	0.029004375	0.029004375	0.01901901
DOKA SE Equity	dormakaba Holding AG	Industrial Goods & Services	Switzerland	Core	0.82363596	0.703115386	-0.1204801	0.175709742	0.231643726	Higher	0.019778065	0.025815115	0.016286516	0.01851411
DRX LN Equity	Drax Group PLC	Industrial Goods & Services	Great Britain	Core	0.387137897	0.730206547	0.34306865	0.246897047	0.512332191	Higher	0.045675295	0.022514508	0.018104618	0.016440241
SMDS LN Equity	DS Smith PLC	Industrial Goods & Services	Great Britain	Core	1.574495275	0.531168109	-1.04332717	0.336623644	0.200697801	Lower	0.041521932	0.065176085	0.065176085	0.036166883
DSV DC Equity	DSV A/S	Industrial Goods & Services	Denmark	Nordic	0.810338364	0.791016036	-0.01932234	0.186108254	0.225196889	Higher	0.087190311	0.04908525	0.04908525	0.069698934
DUE GY Equity	Duerr AG	Industrial Goods & Services	Germany	Core	1.379914149	1.459593345	0.079679196	0.332897973	0.372085555	Higher	0	0.024258	0.033473957	0.035406685
DUFN VX Equity	Durify SA	Retail	Switzerland	Core	1.458435431	0.986919312	-0.47151622	0.295074662	0.310877054	Higher	0.037660085	0.048968934	0.054955138	0.048338382
EOAN GY Equity	E.ON SE	Utilities	Germany	Core	1.095748064	1.339136996	0.243388932	0.308069949	0.369280701	Higher	0.568977639	0.258722393	0.623401359	0.346446729
EZJ LN Equity	easyJet PLC	Travel & Leisure	Great Britain	Core	0.453755901	0.414170786	-0.03958512	0.257379214	0.359147303	Higher	0.037235227	0.049692836	0.06895704	0.020581321
EBRO SQ Equity	Ebro Foods SA	Food & Beverage	Spain	Periphery	0.627542898	0.67855997	0.051017072	0.184326612	0.192287996	Higher	0.022472344	0	0.014102988	0.015249512
EDEN FP Equity	Edenred	Industrial Goods & Services	France	Core	0.794803906	1.58690668	0.792126762	0.208304257	0.374568366	Higher	0.072626328	0.053787639	0.057723689	0.085357254
EDP LN Equity	EDP - Energias de Portugal SA	Utilities	Portugal	Periphery	1.10393638	0.888466195	-0.21532644	0.286509142	0.255530338	Lower	0.096339049	0.107989902	0.106338933	0.095945377
FER FP Equity	Effrage SA	Construction & Materials	France	Core	1.6684046	0.622594872	-1.04580973	0.434167181	0.29037272	Lower	0.035367918	0.064120984	0.059007997	0.039911396
EDF FP Equity	Electricite de France SA	Utilities	France	Core	1.104474673	1.12462899	0.020153417	0.284758889	0.32814777	Higher	0.094351213	0.058376508	0.104208525	0.065651861
ECM LN Equity	Electrocomponents PLC	Technology	Great Britain	Core	1.317590363	0.529750943	-0.78783942	0.285349148	0.322300076	Higher	0.021935508	0.016909688	0.029241953	0.008957923
ELUXB SS Equity	Electrolux AB	Personal & Household Goods	Sweden	Nordic	1.273626172	0.790618155	-0.48300802	0.285969225	0.305429722	Higher	0.074094623	0.076432623	0.094368851	0.060429019
EKTAB SS Equity	Elekta AB	Health Care	Sweden	Nordic	0.276453246	0.985473542	0.709020296	0.215375838	0.370868598	Higher	0.066941902	0.036516361	0.018506306	0.035985907
ELM LN Equity	Elements PLC	Chemicals	Great Britain	Core	1.090570905	0.810269334	-0.28030157	0.304337232	0.28936326	Lower	0.021617871	0.020246643	0.023575821	0.016405234
ELSA FH Equity	Elisa OYJ	Telecommunications	Finland	Nordic	0.525838613	0.668622975	0.142786362	0.205956482	0.19946549	Lower	0.041863807	0.060148705	0.022013417	0.040216806
EMSN SE Equity	EMS-Chemie Holding AG	Chemicals	Switzerland	Core	0.760604996	0.467645736	-0.10841476	0.260887149	0.229096114	Higher	0.050259593	0.0393308639	0.014992495	0.018382518
ENG SQ Equity	Enagas SA	Utilities	Spain	Periphery	0.676529695	0.58094841	-0.09558129	0.185301372	0.17487644	Lower	0.054197148	0.076741557	0.03666598	0.044582886
ELE SQ Equity	Endesa SA	Utilities	Spain	Periphery	0.930570191	0.769077761	-0.16149243	0.236468062	0.205209386	Lower	0.073356197	0.023477813	0.023477813	0.05641662
ENEL IM Equity	Enel SpA	Utilities	Italy	Periphery	1.219271948	0.73153098	-0.48774097	0.312679366	0.184643312	Lower	0.337737492	0.374598295	0.41179385	0.274030258
ENGI FP Equity	Engie SA	Utilities	France	Core	1.136280628	0.928811568	-0.20746906	0.286831411	0.256785919	Lower	0.461794607	0.329207689	0.524728265	0.305771909
ENI IM Equity	Eni SpA	Oil & Gas	Italy	Periphery	1.340310249	1.027989886	-0.31231056	0.251552829	0.273040266	Higher	0.817339557	0.500396362	1.095488586	0.514407201
EBS AV Equity	Erste Group Bank AG	Banks	Austria	Core	2.043176598	1.442171868	-0.90100473	0.495323906	0.307341738	Lower	0.095151066	0.101018607	0.19441043	0.115380611
ESNT LN Equity	Essentra PLC	Real Estate	Great Britain	Core	0.720846405	1.315210052	0.594365847	0.250653275	0.498862016	Higher	0.033461426	0.021434482	0.021434482	0.040088804
EI FP Equity	Essilor International SA	Health Care	France	Core	0.34422657	0.991917247	0.650690677	0.176253275	0.230318807	Higher	0.272698984	0.311151148	0.093052139	0.30863619
RF FP Equity	Eurofins SA	Industrial Goods & Services	France	Core	1.578531795	1.038905699	-0.5396261	0.345007407	0.27459822	Lower	0.02283059	0.032771672	0.036038812	0.034046677
EUFQ SQ Equity	Eurofins Scientific SE	Health Care	France	Core	0.886511543	0.861400529	-0.02511101	0.26692862	0.271782467	Lower	0	0.03743177	0.033183697	0.032243747
ETL FP Equity	Eutelsat Communications SA	Media	France	Core	0.59107083	0.4568523	-0.1342176	0.236391431	0.347889579	Higher	0.055910639	0.048524098	0.033047148	0.021168391
EXOR LN Equity	EXOR NV	Financial Services	Italy	Periphery	1.241913137	1.421613	0.179717863	0.18660435	0.30865231	Higher	0.022032197	0.052450639	0.027362075	0.021168391
EXPN LN Equity	Experian PLC	Industrial Goods & Services	Great Britain	Core	0.909591716	0.421942228	-0.18724949	0.296185964	0.204921042	Higher	0.029122423	0.214781295	0.029122423	0.155059687
FABG SS Equity	Fabege AB	Real Estate	Sweden	Nordic	0.958769823	0.688914933	-0.26985489	0.157646296	0.246265991	Lower	0	0.029122423	0.029122423	0.020062872
BALDS SS Equity	Fastighets AB Balder	Industrial Goods & Services	Sweden	Nordic	0.698900928	0.926216875	0.227315947	0.217767898	0.296921783	Higher	0	0.026338053	0.018407689	0.023499479

Appendix - Summary Table of Results (4/12)

Ticker	Name	Sector	Country	Region	1st Period Beta	2nd Period Beta	Beta Result	Beta Dif	1st Period Volatility	2nd Period Volatility	Volatility Result	1st P. Average Weight	2nd P. Average Weight	1st Period Beta X 1st P. Average Weight	2nd Period Beta X 2nd P. Average Weight
EO FP Equity	Faurecia	Automobiles & Parts	France	Core	2.092651243	1.537316026	Lower	-0.5553322	0.454862806	0.351676408	Lower	0.031033658	0.034449555	0.074707617	0.047707617
FER SQ Equity	Ferrosol SA	Construction & Materials	Spain	Periphery	1.008437731	1.039558865	Higher	0.022121134	0.211608358	0.236126839	Higher	0.117931557	0.07951963	0.121535442	0.121535442
FINGB SS Equity	Fingerprint Cards AB	Technology	Sweden	Nordic	-0.35716128	0.497394324	Higher	1.425456001	0.785449966	0.821566337	Higher	0.041762603	-0.013974203	0.041762603	0.041762603
FIP LN Equity	Firsigroup PLC	Industrial Goods & Services	Great Britain	Core	0.936113459	0.921416131	Lower	-0.444897733	0.489815751	0.249087486	Lower	0.021375984	0.025355558	0.010500228	0.010500228
FLS DC Equity	FLSmidth & Co. A/S	Construction & Materials	Denmark	Nordic	1.750924625	1.134733475	Lower	-0.61619115	0.37187287	0.324413054	Lower	0.022795643	0.077118356	0.022795643	0.022795643
FLZN SE Equity	Flughafen Zurich AG	Industrial Goods & Services	France	Core	0.744748475	0.729043905	Lower	-0.01570454	0.179517883	0.196750645	Higher	0.023364461	0.036697787	0.017400159	0.026754299
FDR FP Equity	Fondiere Des Regions	Real Estate	Finland	Nordic	1.242328548	0.926526998	Lower	-0.31580195	0.282348243	0.234946464	Lower	0.029003344	0.031162856	0.036029198	0.028873196
FORTUM FH Equity	Fortum OY	Utilities	Germany	Core	0.792366967	1.088472916	Higher	0.296105948	0.236125047	0.297312311	Higher	0.126997787	0.087755131	0.100628851	0.095519083
FRA GY Equity	Fraptor AG Frankfurt Airport Services: Wo	Industrial Goods & Services	Germany	Core	1.100525677	0.829523883	Lower	-0.27100179	0.250377818	0.198097702	Lower	0.026449623	0.032497314	0.021940594	0.021940594
FRENET AG	Freenet AG	Telecommunications	Germany	Core	0.488587353	0.779952037	Higher	0.291364683	0.207665994	0.201652046	Lower	0.046196115	0.014114569	0.036030754	0.036030754
FNTM GY Equity	Fresenius Medical Care AG & Co KGAA	Health Care	Germany	Core	0.7153008374	1.032390501	Higher	0.817082127	0.178757376	0.250089877	Higher	0.125234787	0.042319877	0.191418895	0.191418895
FRE GY Equity	Fresenius SE & Co KGaA	Health Care	Germany	Core	0.384051082	1.107971319	Higher	0.723920237	0.166538801	0.269328665	Higher	0.190801557	0.328077836	0.073277545	0.363500833
FRES LN Equity	Fresnillo PLC	Basic Resources	Great Britain	Core	1.180674334	0.035868387	Lower	-1.1448095	0.44374166	0.85816763	Higher	0.056054159	0.03172492	0.066178519	0.001139628
FPEP GY Equity	FUCHS PETROLIUB SE	Chemicals	Germany	Core	0.67688105	1.033140737	Higher	0.356259686	0.216181852	0.244066284	Higher	0.031799386	0.035740344	0.021524402	0.036924806
FUR NA Equity	Fugro NV	Utilities	Netherlands	Core	1.39847016	1.634046845	Higher	0.235576684	0.332309556	0.511666579	Higher	0.07914885	0.08347244	0.02994064	0.02994064
G4S PLC	G4S PLC	Industrial Goods & Services	Great Britain	Core	0.316470763	0.601306611	Higher	0.284835848	0.291707238	0.280219169	Lower	0.06381018	0.025893467	0.036894943	0.036894943
GALP NA Equity	Galapagos NV	Health Care	Netherlands	Core	0.442394143	1.430559562	Higher	0.98165419	0.372485544	0.526479408	Higher	0.032781833	0.104502491	0.046896365	0.046896365
VFN VX Equity	Galencia AG	Retail	Switzerland	Core	0.730010958	0.875340489	Higher	0.14532953	0.227751282	0.239843794	Higher	0.057073111	0.034047895	0.04995858	0.04995858
GAIP PL Equity	Galp Energia SGPS SA	Oil & Gas	Portugal	Periphery	1.138386408	0.95233543	Lower	-0.18605098	0.255788479	0.320411254	Higher	0.04772836	0.063485669	0.054327028	0.060459842
GAM SE Equity	GAM Holding AG	Financial Services	Switzerland	Core	1.224045292	1.418330945	Higher	0.197925654	0.322707088	0.401494545	Higher	0.039320491	0.042842148	0.043004491	0.043004491
SGRE SQ Equity	Siemens Gamesa Renewable Energy SA	Oil & Gas	Spain	Periphery	1.70990141	1.139754087	Lower	-0.570147473	0.557886979	0.340421833	Lower	0.046504066	0.079517367	0.053000199	0.053000199
GAS SQ Equity	Siemens Energy PLC	Utilities	Spain	Periphery	1.28333869	1.017875816	Lower	-0.26546287	0.313152708	0.241768711	Lower	0.075312574	0.088921689	0.09665154	0.09665154
GIA GY Equity	GEA Group AG	Industrial Goods & Services	Germany	Core	1.507945539	0.860837154	Lower	-0.64740839	0.32197566	0.284859723	Lower	0.093793705	0.116909658	0.080741106	0.080741106
GEBN VX Equity	Geberit AG	Construction & Materials	Switzerland	Core	0.4246164	0.612365071	Lower	-0.31209657	0.201141557	0.219623594	Higher	0.121232362	0.165627705	0.1120755	0.101424621
GFC FP Equity	Geena SA	Real Estate	France	Core	1.563065977	0.58173427	Lower	-0.98129255	0.317113694	0.1903964	Lower	0.030723787	0.060406636	0.048023306	0.035143092
GTO NA Equity	Gemalto NV	Technology	Netherlands	Core	0.318684617	1.028646663	Higher	0.709862046	0.273335951	0.317010276	Higher	0.098186733	0.066071541	0.031290602	0.06796427
GEN LN Equity	Genel Energy PLC	Utilities	Great Britain	Core	0.415837764	0.630421298	Higher	0.214585354	0.264123894	0.681664833	Higher	0.0309786	0.017142375	0.012882072	0.010806918
GENC ID Equity	Genmab A/S	Health Care	Denmark	Nordic	0.76178596	1.276384427	Higher	0.502095831	0.495969216	0.446057855	Lower	0.092514074	0.071807444	0.118083923	0.118083923
FIN SE Equity	Georg Fischer AG	Industrial Goods & Services	Switzerland	Core	1.536257145	0.649670653	Higher	-0.88656849	0.312016618	0.240010616	Lower	0.024020282	0.035945967	0.036919458	0.02335304
GXI GY Equity	Gerresheimer AG	Health Care	Germany	Core	0.429078863	0.668116531	Higher	0.239037668	0.199090682	0.211147848	Higher	0.022584774	0.009692667	0.017688374	0.017688374
GETB SS Equity	Getinge AB	Health Care	Sweden	Nordic	0.666418759	0.898406281	Higher	0.231987523	0.21304714	0.26426416	Higher	0.076597475	0.050405459	0.051045994	0.045284581
GIVN VX Equity	Givaudan SA	Chemicals	Switzerland	Core	0.5690269	0.638790133	Higher	0.069763233	0.177626846	0.197177448	Higher	0.116416098	0.178848689	0.066243892	0.114246777
GIFNO Equity	Gjensidige Forsikring ASA	Insurance	Norway	Nordic	0.215736495	0.781217111	Higher	0.565534716	0.191134624	0.208648751	Higher	0.034374016	0.038804852	0.00741573	0.028754572
GKLN LN Equity	GKN PLC	Automobiles & Parts	Great Britain	Core	1.483085105	0.747761891	Lower	-0.73532321	0.281942148	0.210737524	Lower	0.085406623	0.09092918	0.12666974	0.067992432
GLB ID Equity	Glabia PLC	Food & Beverage	Ireland	Periphery	0.909325326	0.577148807	Higher	0.486823481	0.259059718	0.224582415	Lower	0.040030639	0.002439794	0.002439794	0.002439794
SK LN Equity	GlaxoSmithKline PLC	Health Care	Great Britain	Core	0.367921626	0.612866723	Higher	0.24945098	0.138525637	0.192363412	Higher	1.61951659	1.213746443	0.595855177	0.743864805
GLEN LN Equity	Glencore PLC	Basic Resources	Great Britain	Core	1.515875619	1.419572341	Lower	-0.09630228	0.382106239	0.589883408	Higher	0.31061569	0.389971016	0.470848504	0.553592068
GN DC Equity	GN Store Nord A/S	Health Care	Denmark	Nordic	0.70455548	0.860453378	Higher	0.14999783	0.307548927	0.239503851	Lower	0.035166426	0.038107967	0.024984183	0.032790129
GPOR LN Equity	Great Portland Estates PLC	Real Estate	Great Britain	Core	0.807033492	0.516161574	Lower	-0.29089192	0.221045251	0.210320551	Lower	0.031266263	0.040970033	0.025256616	0.021146337
GKLN LN Equity	Greene King PLC	Travel & Leisure	Great Britain	Core	0.765837685	0.402290358	Lower	-0.36354733	0.302825	0.22343431	Higher	0.028762311	0.039211639	0.022027262	0.015774464
GRB SQ Equity	Grifols SA	Health Care	Spain	Periphery	1.019874618	0.958405444	Lower	-0.061469317	0.285168396	0.189916166	Lower	0.06019318	0.07059082	0.061780011	0.071956201
GLB BB Equity	Grupa Bruxelles Lambert SA	Financial Services	Belgium	Core	0.836214618	0.980907416	Higher	0.144692524	0.176201662	0.25482415	Higher	0.084916138	0.071007338	0.071007338	0.071007338
GET FP Equity	Grupa Eurotunnel SE	Industrial Goods & Services	France	Core	1.29371644	0.897244672	Lower	-0.33212697	0.290975208	0.256479813	Lower	0.067001448	0.064493421	0.059846352	0.059846352
GVC LN Equity	GVC Holdings PLC	Travel & Leisure	Great Britain	Core	0.113394978	0.03471441	Lower	-0.00992354	0.342130438	0.254635692	Lower	0.030664158	0.000410746	0.000410746	0.000410746
LUN DC Equity	H Lundbeck A/S	Health Care	Denmark	Nordic	0.94981647	0.33960439	Higher	0.04622092	0.215166471	0.34259328	Higher	0	0.00850575	0.009792448	0.009792448
HMA LN Equity	Haima PLC	Industrial Goods & Services	Great Britain	Core	1.03397335	0.45576864	Lower	-0.57830092	0.221442714	0.17527852	Lower	0.03598387	0.05454303	0.03720642	0.04819063
HMSO LN Equity	Hammerston PLC	Real Estate	Great Britain	Core	0.889165631	0.596370485	Lower	-0.29279515	0.200699247	0.176048433	Lower	0.070362092	0.08234607	0.062363909	0.047849551
HNR1 GY Equity	Hannover Rueck SE	Insurance	Germany	Core	0.660533059	0.989478099	Higher	0.32884985	0.173846809	0.229149054	Higher	0.05362277	0.074989967	0.035419613	0.074200991
HLI LN Equity	Hargreaves Lansdown PLC	Financial Services	Great Britain	Core	1.549634085	1.240624074	Lower	-0.30901001	0.357174723	0.299693618	Lower	0.051467557	0.051467557	0.051467557	0.063851891

Appendix – Summary Table of Results (5/12)

Ticker	Name	Sector	Country	Region	1st Period Beta	2nd Period Beta	Beta Diff	Volatility	1st Period Volatility	2nd Period Volatility	Volatility Result	1st P. Average Weight	2nd P. Average Weight	1st Period Beta X 1st P. Average Weight	2nd Period Beta X 2nd P. Average Weight
HAV FP Equity	Havas SA	Media	France	Core	1.056272728	0.752488297	-0.28423895	0.259682082	0.2101900237	Lower	0.0199385	0.018046688	0.020670786	0.013579921	
HAS LN Equity	Hays PLC	Industrial Goods & Services	Great Britain	Core	1.530899545	0.979413368	-0.55148618	0.365517566	0.322698953	Lower	0.024936689	0.032581459	0.038166638	0.031591597	
HEI GY Equity	HeidelbergCement AG	Construction & Materials	Germany	Core	1.894509515	0.965994767	-0.92851475	0.351466451	0.226099568	Lower	0.112015716	0.136664525	0.212214974	0.132017216	
HEIO NA Equity	Heineken Holding NV	Food & Beverage	Netherlands	Core	0.68471867	0.94477502	0.276303153	0.195420228	0.21146447	Higher	0.06978689	0.084404279	0.046778785	0.079473054	
HEIA NA Equity	Heineken NV	Food & Beverage	Netherlands	Core	0.623177011	0.987421569	0.362445458	0.202238916	0.229705832	Higher	0.18362723	0.211567902	0.114432268	0.208906709	
HTO GA Equity	Hellenic Telecommunications Organization	Telecommunications	Greece	Periphery	1.832591198	0.538065394	-1.29452736	0.710895362	0.3522282893	Lower	0.023365543	0.027290104	0.040983232	0.014683812	
HEIN SE Equity	Helvetia Holding AG	Insurance	Switzerland	Core	1.302728523	0.738310711	-0.56887745	0.235600962	0.222871815	Lower	0.039386656	0.040290681	0.040290681	0.022341472	
HENDSON GP PLC	Henderson Group PLC	Financial Services	Great Britain	Core	1.896437104	1.335049009	-0.56108809	0.729212341	0.336494915	Lower	0.0323384967	0.048802082	0.061406838	0.065153171	
HEN3 GY Equity	Henkel AG & Co KGaA	Personal & Household Goods	Germany	Core	0.628837145	0.909941625	0.28157048	0.162874009	0.212516102	Higher	0.192986639	0.245373729	0.121267236	0.22327536	
HMB55 Equity	Hermes & Mauritz AB	Retail	Sweden	Nordic	0.753706409	0.793525534	0.039818925	0.207302117	0.217530644	Higher	0.462157836	0.387528967	0.348313133	0.307514875	
RMS FP Equity	Hermes International	Personal & Household Goods	France	Core	0.961303936	0.55289743	0.056767093	0.253185761	0.204708895	Lower	0.037977279	0.093062984	0.01884168	0.051448755	
HEXAB SS Equity	Hexagon AB	Technology	Sweden	Nordic	1.329197281	1.003226543	-0.32586644	0.295544434	0.271531465	Lower	0.074859	0.11103541	0.099502042	0.111393648	
HFOLB SS Equity	Hexopol AB	Chemicals	Sweden	Nordic	0.818375382	0.871857588	0.053482206	0.33458279	0.295831363	Higher	0.030014607	0.027564676	0.027564676	0.0291609923	
HIK LN Equity	Hikma Pharmaceuticals PLC	Health Care	Great Britain	Core	0.811697492	0.850339529	0.038642037	0.22756134	0.35812584	Higher	0.023806623	0.049338672	0.019367608	0.041954623	
HISX LN Equity	Hiscox Ltd	Insurance	Great Britain	Core	0.602667434	0.371018047	-0.23164939	0.198243657	0.19883617	Higher	0	0.047306213	0.028509914	0.017551459	
HOT GY Equity	HOCHTIEF AG	Construction & Materials	Germany	Core	1.939708213	0.802849897	-1.13685832	0.364268867	0.226527456	Lower	0.026855836	0.04685836	0.052092486	0.025316688	
HOLM SS Equity	Holmen AB	Basic Resources	Sweden	Nordic	-0.26859333	0.582866669	0.851405956	0.501427469	0.187567464	Lower	0.020642049	0	-0.00543202	0.012031562	
HWDN LN Equity	Howden Joinery Group PLC	Industrial Goods & Services	Great Britain	Core	0.874253602	0.508726022	-0.36482598	0.25473994	0.178756133	Lower	0.0313565	0.049887164	0.027413533	0.025413494	
HSBA LN Equity	HSCB Holdings PLC	Banks	Great Britain	Core	1.158964335	0.847593487	-0.30938085	0.227870852	0.232406676	Higher	2.417914213	1.843693033	2.79714051	1.563683769	
HUFVA SS Equity	Hufvudstaden AB	Real Estate	Sweden	Nordic	0.795722134	0.565897354	-0.22982458	0.205146161	0.209317264	Lower	0.019174452	0	0.015259923	0.010824793	
BOSS GY Equity	HUGO BOSS AG	Personal & Household Goods	Germany	Core	0.825055551	0.484771233	-0.34028243	0.310030825	0.313007817	Higher	0.036639158	0.0660537803	0.080293941	0.029346991	
HUHLV FH Equity	Huhtamaki OY	Industrial Goods & Services	Finland	Nordic	0.621372816	0.978054905	0.356682089	0.317718827	0.25475622	Higher	0	0.040351672	0.025073432	0.039466151	
HTG LN Equity	Hunting PLC	Utilities	Great Britain	Core	1.420085273	0.799135301	-0.62094097	0.337749019	0.602177998	Lower	0.026158353	0.012224333	0.037147092	0.009768896	
HQBQ SS Equity	Husqvarna AB	Personal & Household Goods	Sweden	Nordic	1.378036355	0.751443308	-0.62569328	0.305665486	0.236403935	Lower	0.030575213	0.03630159	0.042133755	0.027278579	
IBE SQ Equity	Iberdrola SA	Utilities	Spain	Periphery	1.072539862	0.746870903	-0.32566896	0.325662577	0.18831122	Lower	0.318045459	0.45388982	0.34116433	0.338997099	
ICA SS Equity	ICA Gruppen AB	Retail	Sweden	Nordic	0.241600667	0.658903209	0.417302543	0.282243896	0.239222988	Higher	0.0270468	0.031735115	0.006534525	0.020010369	
ICAD FP Equity	ICADE	Real Estate	France	Core	1.287327465	0.744546091	-0.54278097	0.281010917	0.212691216	Lower	0.028608721	0.031642	0.086828793	0.02355894	
IGG LN Equity	IG Group Holdings PLC	Financial Services	Great Britain	Core	0.808278997	-0.183142201	-0.9914212	0.230207238	0.380744077	Higher	0.038663131	0.046283852	0.031412253	-0.009476527	
ILD FP Equity	Ilial SA	Technology	France	Core	0.084212983	0.561897314	0.47768433	0.207878161	0.243711446	Higher	0.048816107	0.063616574	0.037737119	0.035745982	
NK FP Equity	Imerys SA	Basic Resources	France	Core	1.34926424	0.959212428	-0.375714	0.286578252	0.212183994	Lower	0.026872	0.027982623	0.035872143	0.02684128	
IMI LN Equity	IMI PLC	Industrial Goods & Services	Great Britain	Core	1.65856757	0.79366673	-0.8669028	0.308328569	0.239629876	Lower	0.072711967	0.05195441	0.113656525	0.030100643	
IIA AV Equity	IMMOFINANZ AG	Utilities	Austria	Core	4.571107547	1.20878796	-3.36231959	1.57566475	0.329818741	Lower	0.049709377	0.024065426	0.227318331	0.029089997	
IMB LN Equity	Imperial Brands PLC	Personal & Household Goods	Great Britain	Core	0.363332612	0.438860792	0.04252818	0.168657856	0.204929117	Higher	0.51817777	0.567225066	0.285370749	0.246932841	
INCH LN Equity	Incapac PLC	Retail	Great Britain	Core	1.515719546	0.695772383	-0.81994716	0.320529798	0.37991424	Lower	0.039342361	0.051117656	0.059631985	0.035566253	
ITX SQ Equity	Industria de Diseño Textil SA	Textile	Spain	Periphery	0.690434272	0.982080702	0.29164643	0.194702329	0.205497339	Higher	0.033196908	0.413533639	0.229202843	0.406123407	
INDIA SS Equity	Industrieland AB	Financial Services	Sweden	Nordic	1.144387504	0.890827381	-0.25350012	0.214378233	0.198494885	Lower	0.04270777	0.04832613	0.038045211	0.038045211	
IFX GY Equity	Infineon Technologies AG	Technology	Germany	Core	1.312839152	1.11598553	-0.19685362	0.353003321	0.296241587	Lower	0.12706	0.187450295	0.166809343	0.209191817	
INF LN Equity	Infonema PLC	Media	Great Britain	Core	1.241493726	0.433766474	-0.80772725	0.245426275	0.179802662	Lower	0.057003689	0.070157607	0.076976972	0.030432018	
INGA NA Equity	ING Group NV	Banks	Netherlands	Core	2.26857616	1.21827545	-1.05034861	0.438691782	0.291109429	Lower	0.463500164	0.635786836	1.049216846	0.763350761	
ING FP Equity	Ingenico Group SA	Technology	France	Core	0.741394222	0.87552765	0.046158543	0.254399719	0.25811234	Higher	0.032475627	0.071550131	0.024077243	0.056349504	
ISAT LN Equity	Immaris PLC	Telecommunications	Great Britain	Core	0.786584072	0.463352549	-0.32723152	0.289661471	0.331004373	Higher	0.054839079	0.066923279	0.040389187	0.031009072	
HG LN Equity	InterContinental Hotels Group PLC	Travel & Leisure	Great Britain	Core	1.084291716	0.85498997	-0.2293075	0.236633454	0.30443805	Higher	0.095411997	0.11055841	0.10345357	0.094526331	
ICP LN Equity	Intermediate Capital Group PLC	Financial Services	Great Britain	Core	1.69435038	0.92349675	-0.77082038	0.322878641	0.288309721	Lower	0.03199377	0.036810525	0.039609517	0.029069517	
IAG LN Equity	International Consolidated Airlines Group	Industrial Goods & Services	Great Britain	Core	1.530033089	0.909291325	-0.62074404	0.36020642	0.352573597	Lower	0.041455978	0.089767639	0.068434994	0.081624936	
IPE LN Equity	Interneer International Finance PLC	Financial Services	Great Britain	Core	2.415071816	0.191977559	-2.22309446	0.509578969	0.480227475	Lower	0.027488091	0.018480091	0.067015608	0.003596696	
ITRK LN Equity	Intertek Group PLC	Industrial Goods & Services	Great Britain	Core	0.64739481	0.568579942	-0.07881887	0.193196997	0.231344785	Higher	0.094612951	0.079736738	0.061515933	0.04533671	
ISP IM Equity	Intesa Sanpaolo SpA	Banks	Italy	Periphery	1.844457461	1.043263793	-0.80119367	0.401494546	0.339181464	Lower	0.334667885	0.492282852	0.617280678	0.153539145	
INTRUM SS Equity	Intrum Justitia AB	Financial Services	Sweden	Nordic	0.662230052	0.776695286	0.1144665234	0.258242406	0.228626437	Higher	0.023755	0.02857159	0.025731275	0.022191419	
INTU LN Equity	Intu Properties PLC	Real Estate	Great Britain	Core	0.948686199	0.672469469	-0.27639673	0.191767692	0.217876997	Higher	0.044750492	0.045983049	0.042462229	0.030921297	

Appendix - Summary Table of Results (6/12)

1st Period Beta	2nd Period Beta	Beta Dif	Beta Result	Volatility	Volatility Result	1st P. Average Weight	2nd P. Average Weight	X 1st P. Average Weight	1st Period Beta Weight	2nd Period Beta Weight	X 2nd P. Average Weight	
INVP LN Equity	Investec PLC	Great Britain	Core	1.570725288	1.083157284	-0.487568	Lower	0.303955846	0.263406038	0.050738656	0.07020264	0.050957945
INVEE SS Equity	Investor AB	Sweden	Nordic	1.044719819	1.061957334	0.01687914	Higher	0.189093175	0.121563212	0.197496148	0.156065881	0.209661068
IPN FF Equity	Ipsen SA	France	Health Care	0.567496344	0.747998176	0.180501831	Higher	0.256874865	0.275581926	0.8052424	0.071322395	0.028232076
ITV LN Equity	ITV PLC	Great Britain	Media	0.076900978	0.710001158	-0.36686082	Lower	0.260439157	0.241755213	0.143025328	0.086208077	0.101553726
IWG LN Equity	IWG PLC	Great Britain	Industrial Goods & Services	1.335494091	0.793345129	-0.54214896	Lower	0.386896439	0.259446499	0	0.026766833	0.021235337
SBRV LN Equity	Sainsbury PLC	Great Britain	Retail	0.507150691	0.620251975	0.113102184	Higher	0.160692421	0.235030865	0.100211918	0.050822548	0.039748238
DEC FP Equity	JCDecaux SA	France	Media	0.934688459	1.004870622	0.091821631	Higher	0.30135136	0.276080998	0.028574131	0.020001508	0.028713305
JMT PL Equity	Jerónimo Martins SGPS SA	Portugal	Retail	0.306845019	0.876011506	-0.569196487	Lower	0.261199041	0.264224873	0.04214023	0.071547908	0.036916159
JM SS Equity	JM AB	Sweden	Real Estate	1.459900643	1.119810542	-0.3400901	Lower	0.344881256	0.164202405	0.025407483	0.033015366	0.028451522
WVG LN Equity	John Wood Group PLC	Great Britain	Utilities	1.319949702	0.545281281	-0.77466842	Lower	0.303414119	0.340368811	0.042682033	0.07685234	0.023273713
JMAT LN Equity	Johnson Matthey PLC	Great Britain	Chemicals	1.038727697	0.802163815	-0.23656388	Lower	0.240232515	0.224744428	0.058274443	0.104736607	0.084015916
BAER VX Equity	Julius Baer Group Ltd	Switzerland	Banks	0.976487387	1.167865218	0.191257831	Higher	0.254933109	0.358692226	0.114427131	0.11278665	0.142302121
JUP LN Equity	Jupiter Fund Management PLC	Great Britain	Financial Services	1.574915413	0.837486639	-0.62047877	Lower	0.348936702	0.249479454	0.032814951	0.036608985	0.027480048
JYSK DC Equity	Jyske Bank A/S	Denmark	Banks	0.861460432	0.7105778	-0.15088763	Lower	0.29092647	0.264838336	0.031784016	0.039524033	0.027380672
SDF GY Equity	K+S AG	Germany	Chemicals	1.169537699	0.85099334	-0.31854436	Lower	0.416674931	0.393685913	0.06053359	0.128670122	0.05153682
KBC BB Equity	KBC Group NV	Belgium	Banks	1.197344173	0.873807422	-0.32392674	Lower	0.695163557	0.264356436	0.18372993	0.220121955	0.160544108
KER FP Equity	Kering	France	Retail	1.30537805	0.95921561	-0.34616244	Lower	0.271121604	0.243173575	0.16258815	0.245580473	0.155957058
KYG ID Equity	Kerry Group PLC	Ireland	Food & Beverage	0.42937471	0.672344475	0.249407066	Higher	0.213599691	0.199112067	0.096526787	0.141518885	0.040824789
KESKOB FH Equity	Keeko OYJ	Finland	Retail	0.86125972	0.457246475	-0.40401324	Lower	0.251705629	0.237900133	0.023037508	0.035008836	0.015231277
KINDSD SS Equity	Kinred Group PLC	Sweden	Travel & Leisure	0.446669924	0.549676887	0.104987873	Higher	0.230931123	0.295498677	0.027450781	0.012206537	0.0150288533
KINGFISHER PLC	Kingfisher PLC	Great Britain	Retail	0.687758027	0.13340472	-0.55435328	Lower	0.198286933	0.187121081	0.136954078	0.10476105	0.018270419
KSP ID Equity	Kingspan Group PLC	Ireland	Construction & Materials	0.533234218	0.57508902	0.041854683	Higher	0.224052567	0.306710529	0.04290359	0.014353599	0.024673379
KINVB SS Equity	Kinnevik AB	Sweden	Financial Services	0.881402267	1.230795138	0.349392872	Higher	0.217946001	0.298687425	0.073767557	0.065018892	0.097713532
LFP Equity	Klepierre	France	Real Estate	1.16630291	0.800993516	-0.36530939	Lower	0.262134529	0.229951261	0.097217131	0.055460658	0.077870292
KOMB CX Equity	Komercni banka as	Czech Republic	Banks	0.920802935	0.488966403	-0.43113653	Lower	0.257461085	0.217327276	0.047552705	0.035404505	0.017512036
KNEBV FH Equity	Kone OYJ	Finland	Industrial Goods & Services	0.742921586	0.89895005	0.156033419	Higher	0.234760447	0.217464137	0.182575836	0.211214246	0.189869991
KCR FH Equity	Konecranes OYJ	Finland	Construction & Materials	1.979466445	1.270031029	-0.70943542	Lower	0.425434969	0.378419834	0	0.040858037	0.026214627
AD NA Equity	Koninklijke Ahold Delhaize NV	Netherlands	Retail	0.744241842	0.749841953	0.005600111	Higher	0.195202057	0.230179467	0.233458459	0.149045788	0.175056947
DSM NA Equity	Koninklijke DSM NV	Netherlands	Chemicals	0.995688432	0.927297197	-0.06839123	Lower	0.219474879	0.238773719	0.125173082	0.130442138	0.116072648
KPN NA Equity	Koninklijke RPN NV	Netherlands	Telecommunications	0.648789102	0.646344731	-0.00244433	Lower	0.472795523	0.242891981	0.164763426	0.138085246	0.089250677
PHIA NA Equity	Koninklijke Philips NV	Netherlands	Personal & Household Goods	1.389712478	1.05264311	-0.33707825	Lower	0.274519652	0.232447753	0.309595111	0.443684709	0.325890623
VPK NA Equity	Koninklijke Vopak NV	Netherlands	Oil & Gas	0.374462109	0.997194184	0.622732076	Higher	0.217512686	0.301795459	0.04926888	0.037615525	0.037509982
KNIN VX Equity	Kuehne + Nagel International AG	Switzerland	Industrial Goods & Services	0.773001334	0.692554572	-0.08044676	Lower	0.210682002	0.189721399	0.093618918	0.091828049	0.065359593
LUNDB SS Equity	L E Lundbergforeningen AB	Sweden	Financial Services	0.871246473	0.717695619	-0.15338685	Lower	0.17564722	0.199309962	0.028794538	0.07523677	0.020664677
LCL LN Equity	Ladbrokes Coral Group PLC	Great Britain	Travel & Leisure	0.958945306	0.73705429	-0.22189102	Lower	0.31346668	0.313677066	0.03545477	0.033999186	0.013747813
LHN VX Equity	LafargeHolm Ltd	Switzerland	Construction & Materials	1.441394473	1.411798909	-0.02959556	Lower	0.27302461	0.331854876	0.214752393	0.309542913	0.365268575
MWB FP Equity	Lagardere SCA	France	Media	1.265833398	0.939389868	-0.326643443	Lower	0.343597068	0.256115187	0.044608283	0.033015016	0.056466587
LRE LN Equity	Lancashire Holdings Ltd	Great Britain	Insurance	0.61225041	0.396468601	-0.21578181	Lower	0.223356332	0.25190829	0	0.021385762	0.008478783
LAND LN Equity	Land Securities Group PLC	Great Britain	Real Estate	0.854559015	0.634091156	-0.22046786	Lower	0.203076479	0.202748359	0.136027082	0.116138886	0.095720665
LXS GY Equity	LANXESS AG	Germany	Chemicals	1.371772661	1.29163192	-0.08013974	Lower	0.338385855	0.32542835	0.080705213	0.110764076	0.074783767
LGEN LN Equity	Legat & General Group PLC	Great Britain	Insurance	1.281706855	1.09093688	-0.19161337	Lower	0.24541479	0.267086035	0.181039475	0.232039357	0.268385938
LR FP Equity	Legrand SA	France	Industrial Goods & Services	1.04638917	1.020075589	-0.02613358	Lower	0.217185407	0.233893989	0.13877066	0.17587825	0.17940939
LEO IM Equity	Leonardo SpA	Italy	Industrial Goods & Services	1.790067323	1.346245609	-0.443801141	Lower	0.528045948	0.341470176	0.029781987	0.051550711	0.078280916
LEO GY Equity	Leonar AG	Germany	Automobiles & Parts	1.701648979	0.998547566	-0.70310141	Lower	0.380885627	0.450419131	0.0217600143	0.021532448	0.029949265
LIN GY Equity	Linde AG	Germany	Chemicals	0.836589788	1.063237658	0.22666787	Higher	0.183131962	0.260064437	0.41861852	0.349697254	0.371735054
LLOY LN Equity	Lloyds Banking Group PLC	Great Britain	Banks	1.5073321	0.938298174	-0.56963393	Lower	0.418377393	0.291029508	0.071762625	0.076297132	0.067337657
LOGN SE Equity	Logitech International SA	Switzerland	Technology	0.760189718	0.9329993128	0.16980341	Higher	0.380544808	0.356661382	0.020616556	0.032370443	0.090104289
LSE LN Equity	London Stock Exchange Group PLC	Great Britain	Financial Services	1.251321147	1.046890354	-0.20263079	Lower	0.297914756	0.252414305	0.039017164	0.048823002	0.137870375
LMI LN Equity	Lonmin PLC	Great Britain	Basic Resources	1.277084702	1.832875554	0.555790851	Higher	0.411668697	1.321875214	0	0.131469098	0.054499233

Appendix - Summary Table of Results (7/12)

Ticker	Name	Sector	Country	Region	1st Period Beta	2nd Period Beta	Beta Diff	Beta Result	Beta Dif	1st Period Volatility	2nd Period Volatility	Volatility Result	1st P. Average Weight	2nd P. Average Weight	1st Period Beta X 1st P. Average Weight	2nd Period Beta X 2nd P. Average Weight
LONV.VX Equity	Lonza Group AG	Health Care	Switzerland	Core	1.25744331	0.90860361	-0.34878025	Lower	-0.34878025	0.36341462	0.28988544	Lower	0.04136008	0.09767671	0.052007979	0.088755229
OR.FP Equity	L'Oréal SA	Personal & Household Goods	France	Core	0.424965809	0.883802122	-0.458836314	Higher	-0.458836314	0.140042102	0.20174766	Higher	0.440237738	0.523441787	0.071805986	0.462618962
LUPF.SS Equity	Lundin Petroleum AB	Oil & Gas	Sweden	Nordic	0.251563577	0.356531858	-0.284968281	Higher	-0.284968281	0.327794274	0.306698247	Lower	0.04201618	0.022543189	0.018261618	0.022543189
LUX.LM Equity	Luxottica Group SpA	Personal & Household Goods	Italy	Periphery	0.79060446	0.712074452	-0.078530016	Lower	-0.078530016	0.190874195	0.199382886	Higher	0.084683672	0.128867066	0.066951280	0.091762945
MC.FP Equity	LVNH Meet Hennessy Louis Vuitton SE	Personal & Household Goods	France	Core	1.245690858	0.894651632	-0.37793923	Lower	-0.37793923	0.216745884	0.317458884	Lower	0.619540849	0.563254082	0.771750392	0.505774922
EMG.LN Equity	MAN Group PLC	Financial Services	Great Britain	Core	1.991295463	0.994634066	-0.9966614	Lower	-0.9966614	0.605888635	0.218078968	Lower	0.043881967	0.043881967	0.043881967	0.043881967
MAN.GY Equity	MAN SE	Industrial Goods & Services	Germany	Core	1.22023026	0.25834808	-0.96178095	Lower	-0.96178095	0.285729376	0.075153333	Lower	0.070766951	0.043024577	0.066344811	0.01115385
MAP.SQ Equity	Mapfre SA	Insurance	Spain	Periphery	1.288537262	1.474872221	0.18633496	Higher	0.18633496	0.69867133	0.38031395	Lower	0.030075721	0.060747443	0.038753688	0.050695781
MHG.NO Equity	Marine Harvest ASA	Food & Beverage	Norway	Nordic	0.867356088	0.26752044	-0.60010565	Lower	-0.60010565	0.337525004	0.222488209	Lower	0.029154475	0.060747443	0.025287312	0.016234781
MKS.LN Equity	Marks & Spencer Group PLC	Retail	Great Britain	Core	0.632929112	0.434952999	-0.19797681	Lower	-0.19797681	0.227883599	0.276565253	Higher	0.132718754	0.121907459	0.084001563	0.05302393
TLS.SQ Equity	Mediaset Espana Comunicacion SA	Media	Spain	Periphery	1.399601041	1.071415425	-0.32818562	Lower	-0.32818562	0.365814713	0.261206279	Lower	0.015862353	0.026043776	0.022200966	0.027903703
MS.IM Equity	Mediaset SpA	Media	Italy	Periphery	1.987134663	1.429966235	-0.55713843	Lower	-0.55713843	0.532384475	0.445806867	Lower	0.028071131	0.036962148	0.055673812	0.052855732
MB.IW Equity	Mediabanc SpA	Banks	Italy	Periphery	1.333144464	1.53232844	0.199389377	Higher	0.199389377	0.484952555	0.3880808785	Lower	0.042831082	0.059978656	0.057073007	0.091918996
MGGT.LN Equity	Meggitt PLC	Industrial Goods & Services	Great Britain	Core	0.87928667	0.57773933	-0.30154734	Lower	-0.30154734	0.27461953	0.258809558	Higher	0.070264492	0.060541131	0.061359927	0.034916666
MRO.LN Equity	Melrose Industries PLC	Construction & Materials	Great Britain	Core	1.483190517	-0.428423727	-1.91161424	Lower	-1.91161424	0.368266473	1.293504697	Higher	0.057821857	0.046428883	0.085701947	-0.019891021
MIRK.GY Equity	Merck KGaA	Health Care	Germany	Core	0.559029235	1.134550925	0.57552169	Higher	0.57552169	0.192417717	0.257536612	Higher	0.109741279	0.154044754	0.061348583	0.174771618
CEC.GY Equity	METRO AG	Retail	Germany	Core	0.653664026	1.16448792	0.510823894	Higher	0.510823894	0.309125804	0.282036186	Lower	0.06480282	0.058699738	0.042859272	0.068355135
METSO.FH Equity	Metro Oyj	Industrial Goods & Services	Finland	Nordic	1.745622729	1.105206005	-0.64041672	Lower	-0.64041672	0.352481468	0.32729038	Lower	0.06480282	0.058699738	0.042859272	0.068355135
MFCRO.LN Equity	Metro Focus International PLC	Technology	Great Britain	Core	0.320784319	0.424903871	0.10411851	Higher	0.10411851	0.196959752	0.221899746	0.256181527	0	0.034713541	0.12678455	0.038363614
MTO.LN Equity	Mitie Group PLC	Industrial Goods & Services	Great Britain	Core	0.374865592	0.522170825	0.147805333	Higher	0.147805333	0.189924194	0.330110325	Higher	0.021263289	0.01852025	0.007960244	0.009670734
MITG.SS Equity	Modern Times Group MTG AB	Telecommunications	Sweden	Nordic	1.264900084	0.712712151	-0.552687933	Lower	-0.552687933	0.802171793	0.05108713	Lower	0.033113967	0.0175915	0.050948143	0.012538731
MIND.LN Equity	Mondi PLC	Basic Resources	Great Britain	Core	1.405639409	0.758008323	-0.64763109	Lower	-0.64763109	0.293489348	0.252668469	Lower	0.054448852	0.086174902	0.076591678	0.065321293
MONEY.LN Equity	MoneySupermarket.com Group PLC	Media	Great Britain	Core	0.828486311	0.544068774	-0.28441754	Lower	-0.28441754	0.32929054	0.276201544	Lower	0	0.026878125	0.022268159	0.014623549
MTX.GY Equity	MTU Aero Engines AG	Industrial Goods & Services	Germany	Core	0.622888841	0.941676288	0.31878747	Higher	0.31878747	0.168890301	0.222860872	Higher	0.058391777	0.060467705	0.036371582	0.056941004
MTXV.GY Equity	Munich Re	Insurance	Germany	Core	1.057181851	0.860465849	-0.196716	Lower	-0.196716	0.217043856	0.2027643974	Lower	0.355297033	0.353602574	0.375615352	0.304262939
NG./LN Equity	National Grid PLC	Utilities	Great Britain	Core	0.14180197	0.293152001	0.151350031	Higher	0.151350031	1.095656276	0.186827984	Higher	0.564506803	0.625674802	0.880048177	0.18341785
KN.FP Equity	Natixis SA	Banks	France	Core	1.992934711	1.414772264	-0.57816245	Lower	-0.57816245	0.449219941	0.342073571	Lower	0.042817082	0.061735115	0.085331649	0.087341128
NCCB.SS Equity	NCC AB	Chemicals	Sweden	Nordic	1.347547759	0.870269203	-0.47727856	Lower	-0.47727856	0.276395125	0.233697029	Lower	0.022802902	0.029076002	0.03077999	0.025299551
NEO.FP Equity	Neopost SA	Technology	France	Core	0.555735415	1.126721203	0.570985787	Higher	0.570985787	0.218639439	0.381358721	Higher	0.029973393	0.018990818	0.016657276	0.021397358
NEST.FH Equity	Neste Oyj	Utilities	Finland	Nordic	1.282524264	0.800831822	-0.48169244	Lower	-0.48169244	0.389995246	0.306805357	Lower	0.023668197	0.047972836	0.030650307	0.038418174
NESN.VX Equity	Nestle SA	Food & Beverage	Switzerland	Core	0.13416724	0.593261424	0.79844699	Higher	0.79844699	1.205888935	0.181254701	Higher	2.897566889	2.833408993	0.906683826	1.680951898
NRXG.LN Equity	NEX Group PLC	Financial Services	Great Britain	Core	1.047659671	0.932274125	-0.1153855	Lower	-0.1153855	0.353434599	0.269887275	Lower	0	0.027909143	0.029239283	0.026018973
NXT.LN Equity	Nex PLC	Retail	Great Britain	Core	0.401118189	0.302575418	-0.09854277	Lower	-0.09854277	1.89129675	0.237267074	Higher	0.12883618	0.162646807	0.052079654	0.04921347
NIBB.SS Equity	Nibe Industrier AB	Construction & Materials	Sweden	Nordic	0.74496735	0.975140425	0.230172872	Higher	0.230172872	0.238111684	0.2594909004	Higher	0	0.030499575	0.014472032	0.028741539
NOKIA.FH Equity	Nokia Oyj	Technology	Finland	Nordic	1.2479198077	1.145889133	-0.10130894	Lower	-0.10130894	0.627639137	0.319620836	Lower	0.227539426	0.350724689	0.283786735	0.401891609
NREI.VX Equity	Nokian Renkaat Oyj	Automobiles & Parts	Finland	Nordic	1.629253299	0.688884852	-0.94036845	Lower	-0.94036845	0.383879172	0.294611795	Lower	0.075154525	0.053837115	0.122510927	0.037088753
NDA.SS Equity	Nordea Bank AB	Banks	Sweden	Nordic	1.492315351	0.946792666	-0.54552268	Lower	-0.54552268	0.265993198	0.251809201	Lower	0.362989148	0.419401934	0.541694277	0.397086676
NHY.NO Equity	Norsk Hydro ASA	Basic Resources	Norway	Nordic	1.247079484	0.871617179	-0.3709083	Lower	-0.3709083	0.266705847	0.325634246	Higher	0.060660393	0.07205559	0.075648332	0.063133031
NOVA.VX Equity	Novartis AG	Health Care	Switzerland	Core	0.365205615	0.872791154	0.507585539	Higher	0.507585539	1.46272583	0.209382474	Higher	2.330187387	2.622735402	0.855088703	2.289103036
NOVOB.DC Equity	Novo Nordisk A/S	Health Care	Denmark	Nordic	0.316659257	1.303275965	0.986616708	Higher	0.986616708	1.886863494	0.339388922	Higher	0.855329393	1.104780393	0.270244652	1.438933734
NZM.BD Equity	Noxovimes A/S	Health Care	Denmark	Nordic	0.166894845	0.980631661	0.813736816	Higher	0.813736816	0.20537303	0.270288993	Higher	0.098489131	0.110756115	0.016433218	0.108610953
OCER.LN Equity	OC Oerlikon Corp AG	Industrial Goods & Services	Switzerland	Core	1.120847303	0.935785744	-0.18506156	Lower	-0.18506156	0.25276236	0.288210642	Higher	0.025320216	0.024292016	0.028413214	0.023921213
OCDO.LN Equity	Ocado Group PLC	Financial Services	Great Britain	Core	1.718680002	0.763496754	-0.95518325	Lower	-0.95518325	0.827699302	0.464439851	Lower	0.0385792	0.031306541	0.0630653	0.023902447
OMV.LN Equity	Old Mutual PLC	Insurance	Great Britain	Core	1.142138685	1.287250046	0.145111361	Higher	0.145111361	0.273434634	0.299372061	Higher	0.183424689	0.160926836	0.209496433	0.207153077
OMV.VX Equity	OMV AG	Oil & Gas	Austria	Core	1.173192904	0.861787664	-0.31140564	Lower	-0.31140564	0.270063207	0.285405427	Higher	0.076558869	0.04912344	0.089791338	0.024333011
OPAP.GA Equity	OPAP SA	Travel & Leisure	Greece	Periphery	1.570295014	1.136113071	-0.43481894	Lower	-0.43481894	0.598399713	0.478921735	Lower	0.025719607	0.021336667	0.04038737	0.024240866
OPRH.LN Equity	OPRH Energy PLC	Utilities	Great Britain	Core	0.667662669	1.321604033	0.654017764	Higher	0.654017764	0.436060677	0.516837888	Higher	0.03712598	0.03712598	0.387965459	0.017575066
ORAF.FP Equity	Orange SA	Telecommunications	France	Core	0.2412861312	0.802818451	-0.56153132	Lower	-0.56153132	0.282871714	0.227788578	Lower	0.355489338	0.355489338	0.046280039	0.046280039
ORNBV.FH Equity	Orion Oyj	Health Care	Finland	Nordic	0.645158635	0.904611287	0.259452652	Higher	0.259452652	0.234294458	0.248163645	Higher	0.030861689	0.045202393	0.019910685	0.036370156

Appendix - Summary Table of Results (8/12)

Ticker	Name	Sector	Country	Region	1st Period Beta	2nd Period Beta	Beta Dif	Beta Result	Beta Dif	1st Period Volatility	2nd Period Volatility	Volatility Result	1st P. Average Weight	2nd P. Average Weight	1st Period Beta Weight	2nd Period Beta Weight
ORK NO Equity	Orkla ASA	Food & Beverage	Norway	Nordic	0.686216902	0.53025876	-0.15596103	Lower	-0.15596103	0.187937072	0.189576917	Higher	0.0868081902	0.078072148	0.06044329	0.021498215
ORP FP Equity	Orpea	Health Care	France	Core	0.581580054	0.588174562	0.006594508	Higher	0.006594508	0.194703912	0.193569817	Lower	0	0.021185922	0.021446148	0.021446148
OUT1V FH Equity	Outokumpu Oyj	Basic Resources	Finland	Nordic	1.981971917	1.533113588	-0.44885838	Lower	-0.44885838	0.588845541	0.65145323	Higher	0.01548925	0.020209185	0.03699259	0.03879028
OUT2V FH Equity	Outokumpu Oyj	Basic Resources	Finland	Nordic	1.707275801	1.885292699	0.178019466	Higher	0.178019466	0.396792969	0.528773541	Higher	0.03032823	0.02098185	0.051778652	0.051778652
PADY ID Equity	Paddy Power Betfair PLC	Travel & Leisure	Ireland	Periphery	-0.093023117	0.82754267	0.521777442	Higher	0.521777442	0.22441091	0.344587525	Higher	0.044459426	0.085480508	-0.001734948	0.021466608
PAGE LN Equity	Pagegroup PLC	Personal & Household Goods	Great Britain	Core	1.195698889	0.897663399	-0.298035149	Lower	-0.298035149	0.36693511	0.278830804	Lower	0.027031877	0.024507709	0.03205156	0.021996673
PNDORA DC Equity	Pandora A/S	Personal & Household Goods	Denmark	Nordic	1.445800345	0.926804816	-0.51899553	Lower	-0.51899553	0.588248564	0.588713772	Lower	0.021542238	0.18518923	0.031145775	0.153098174
PARG SE Equity	Pargesa Holding SA	Financial Services	Switzerland	Core	1.123795012	0.762342391	-0.361452621	Lower	-0.361452621	0.198215522	0.222674175	Higher	0.025023218	0.029559162	0.019076231	0.019076231
PGHN VY Equity	Partners Group Holding AG	Financial Services	Switzerland	Core	0.35370898	0.428393948	0.074605068	Higher	0.074605068	0.19994324	0.250235995	Higher	0.045455094	0.090390066	0.016077859	0.03871943
PAYS LN Equity	Paycom Software Inc	Industrial Goods & Services	Great Britain	Core	0.490505779	0.178299961	-0.312120582	Lower	-0.312120582	0.356334944	0.400285427	Higher	0	0.030541154	0.014980612	0.005445487
PSON LN Equity	Personnel Group PLC	Media	Great Britain	Core	0.617272864	0.597430146	-0.01984849	Lower	-0.01984849	0.19015089	0.380281025	Higher	0.214192262	0.137646098	0.132216308	0.082223929
PNN LN Equity	Pennon Group PLC	Utilities	Great Britain	Core	0.358797636	0.279115582	-0.07968205	Lower	-0.07968205	0.196024238	0.207407078	Higher	0.055648803	0.057639869	0.019068886	0.016088186
RI FP Equity	Rimoldi SA	Food & Beverage	France	Core	0.902449413	1.142824368	0.240374955	Higher	0.240374955	0.191812162	0.251712556	Higher	0.306285295	0.282959459	0.276406695	0.232414107
PSN LN Equity	Personnel PLC	Personal & Household Goods	Great Britain	Core	1.010770031	0.365681161	-0.73539487	Lower	-0.73539487	0.308413903	0.319944821	Higher	0.051239367	0.09693141	0.056434515	0.03544599
PTEC LN Equity	Petrofac Ltd	Oil & Gas	Great Britain	Core	1.002819041	1.166433684	0.163614643	Higher	0.163614643	0.330971653	0.525735623	Higher	0.081574902	0.037013164	0.081800485	0.043713401
PGS NO Equity	Petroleum Geo-Services ASA	Oil & Gas	Norway	Nordic	1.71477141	1.447654247	-0.267116163	Lower	-0.267116163	0.301126311	0.592195009	Higher	0.042141623	0.013872	0.052114481	0.027141611
UG FP Equity	Peugeot SA	Automobiles & Parts	France	Core	2.15762704	1.447654247	-0.70997279	Lower	-0.70997279	0.584111703	0.371193969	Higher	0.038192344	0.089996016	0.082404835	0.130283175
PHR PL Equity	Pharol SGPS SA	Financial Services	Portugal	Periphery	0.820285387	0.96658494	0.146373107	Higher	0.146373107	0.320276119	0.814603357	Higher	0	0	0.04109221	0.048247713
PHX LN Equity	Phoenix Group Holdings	Insurance	Great Britain	Core	0.547050026	0.604261552	0.05700526	Higher	0.05700526	0.252472974	0.168764737	Lower	0	0.035452426	0.011939457	0.021422538
PIREX GA Equity	Piraeus Bank SA	Banks	Greece	Periphery	1.065608152	0.60753846	-0.458070696	Lower	-0.458070696	0.22116372	1.603326812	Higher	0	0.022597	0.01132785	0.069332034
PTFC LN Equity	Proximus SA DP	Telecommunications	Belgium	Core	1.189879184	0.632015186	-0.557864	Lower	-0.557864	0.328860752	0.2511038	Lower	0	0.030923222	0.086176434	0.051934946
PAH3 GY Equity	Porsche Automobil Holding SE	Automobiles & Parts	Germany	Core	1.659434587	1.279077429	-0.38035716	Lower	-0.38035716	0.328125331	0.403233398	Higher	0.143572541	0.11439759	0.23824924	0.146333375
PNL NA Equity	PostNL NV	Industrial Goods & Services	Netherlands	Core	2.243020568	0.75925959	-1.48376098	Lower	-1.48376098	0.678733523	0.376670023	Lower	0.02162372	0.021254393	0.051953677	0.016137602
PMO LN Equity	Premier Oil PLC	Oil & Gas	Great Britain	Core	0.654838941	2.112675054	1.457836113	Higher	1.457836113	0.231412869	1.049683053	Higher	0.04140318	0.015241778	0.027112415	0.032200924
PSM GY Equity	ProSiebenSat.1 Media SE	Media	Germany	Core	1.567665039	0.910400375	-0.65726266	Lower	-0.65726266	0.375125135	0.241564346	Lower	0.039266295	0.121964721	0.061540643	0.111036728
PG LN Equity	Provident Financial PLC	Financial Services	Great Britain	Core	0.696167357	0.607807787	-0.08907957	Lower	-0.08907957	0.293296864	0.26480462	Higher	0.039177787	0.072523967	0.027274296	0.044028415
PROX BB Equity	Proximus SA DP	Telecommunications	Belgium	Core	0.50401253	0.769356421	0.265343892	Higher	0.265343892	0.203921699	0.209168884	Higher	0.057409344	0.058079967	0.028935029	0.044684196
PRY IM Equity	Prysmanian SpA	Insurance	Italy	Periphery	1.649721047	1.279556837	-0.37016421	Lower	-0.37016421	0.295304955	0.274552873	Lower	0.478509672	0.643180131	0.789407477	0.822985534
PSPN SE Equity	PSP Swiss Property AG	Real Estate	Switzerland	Core	1.684061845	1.11238095	-0.5716809	Lower	-0.5716809	0.326760962	0.254920624	Lower	0.050747088	0.053966459	0.085461252	0.060031261
PUB FP Equity	Publishers Groupe SA	Media	France	Core	0.933925484	0.89931743	-0.04460805	Lower	-0.04460805	0.170643061	0.121652477	Higher	0.046627854	0.04364213	0.0160658496	0.022329528
QIA GY Equity	QIAGEN NV	Health Care	Germany	Core	0.30354216	1.22694964	0.92330708	Higher	0.92330708	0.198721111	0.294250947	Higher	0.134799213	0.17274141	0.12589242	0.153621947
QIQ VY Equity	Quintet Group PLC	Retail	Great Britain	Core	0.194816631	0.411247226	0.216430595	Higher	0.216430595	0.22685892	0.188318035	Lower	0.025632789	0.023267443	0.049393694	0.009586671
RBI VY Equity	Raiffeisen Bank International AG	Banks	Austria	Core	2.180053394	1.367051525	-0.81345187	Lower	-0.81345187	0.490649968	0.587720041	Higher	0.020378429	0.021273148	0.044453233	0.029081489
RRS LN Equity	Randgold Resources Ltd	Basic Resources	Great Britain	Core	0.570469375	-0.133374412	-0.70384379	Lower	-0.70384379	0.371824444	0.429905344	Higher	0.119966885	0.088476902	0.068437434	-0.011800055
RAND NA Equity	Randstad Holding NV	Industrial Goods & Services	Netherlands	Core	1.707857511	1.276857813	-0.4309997	Lower	-0.4309997	0.346082518	0.319877936	Lower	0.058228754	0.078707803	0.099446415	0.101775531
RATOS SS Equity	Ratos AB	Financial Services	Sweden	Nordic	1.125632361	0.824087987	-0.30154437	Lower	-0.30154437	0.295219786	0.271697225	Lower	0.031065393	0.014926	0.034568212	0.017300337
RB LN Equity	Reckitt Benckiser Group PLC	Personal & Household Goods	Great Britain	Core	0.339045433	0.575439918	0.236394485	Higher	0.236394485	0.138847722	0.171380834	Higher	0.54138241	0.71506518	0.183553233	0.411471294
REC IM Equity	Recordati SpA	Health Care	Italy	Periphery	0.472080719	0.7931819673	0.319738954	Higher	0.319738954	0.198535612	0.261246798	Higher	0	0.034490513	0.016382306	0.027310267
REE SQ Equity	Red Electrica Corp SA	Utilities	Spain	Periphery	0.952866974	0.542321806	-0.41034891	Lower	-0.41034891	0.263542424	0.161959178	Lower	0.073401213	0.106701639	0.06926912	0.057866226
REN NA Equity	RELX NV	Media	Netherlands	Core	0.765844228	0.990519316	0.224675088	Higher	0.224675088	0.178605222	0.21538745	Higher	0.139306489	0.200534689	0.106687399	0.198633483
RELN LN Equity	RELX PLC	Industrial Goods & Services	Great Britain	Core	0.766603124	0.59222167	-0.17438096	Lower	-0.17438096	0.217089022	0.190065014	Higher	0.168278967	0.23213259	0.129003182	0.137474066
RNO FP Equity	Remy Cointreau SA	Food & Beverage	France	Core	0.586162287	1.334568168	0.748046881	Higher	0.748046881	0.231094077	0.291094077	Higher	0.031718526	0.018391241	0.018592172	0.054454365
RNO PP Equity	Renault SA	Automobiles & Parts	France	Core	2.069839259	1.580091158	-0.4897471	Lower	-0.4897471	0.431401412	0.359279345	Lower	0.155223885	0.214429902	0.302128836	0.338818792
RTO LN Equity	Renold Initial PLC	Industrial Goods & Services	Great Britain	Core	1.017953354	0.338234475	-0.67971888	Lower	-0.67971888	0.255343488	0.158660074	Lower	0.039246623	0.052618066	0.034533684	0.017792444
REP SQ Equity	Repsol SA	Oil & Gas	Spain	Periphery	1.45173506	1.599205077	0.250031512	Higher	0.250031512	0.329964862	0.370008651	Higher	0.257272705	0.186663426	0.295634424	0.216180414
RHM GY Equity	Rheinmetall AG	Industrial Goods & Services	Germany	Core	1.451761438	1.75455882	0.302979381	Higher	0.302979381	0.375419738	0.386520425	Higher	0.032239115	0.054434295	0.046603504	0.095500734
RHM GY Equity	Rheinmetall AG	Automobiles & Parts	Germany	Core	1.699501667	0.933184874	-0.766316179	Lower	-0.766316179	0.3105907639	0.386520425	Higher	0.028612361	0.031420803	0.048626755	0.029332148
RHK GY Equity	RHOEN-KLINIKUM AG	Health Care	Germany	Core	0.139644406	0.575844429	0.4361199814	Higher	0.4361199814	0.4030337033	0.177703139	Lower	0.03543077	0.013840778	0.004947709	0.007970132

Appendix - Summary Table of Results (9/12)

Ticker	Name	Sector	Country	Region	1st Period Beta	2nd Period Beta	Beta Diff	Beta Result	Beta Dif	1st Period Volatility	2nd Period Volatility	Volatility Result	1st P. Average Weight	2nd P. Average Weight	1st Period Beta X 1st P. Average Weight	2nd Period Beta X 2nd P. Average Weight
RMV LN Equity	Rightmove PLC	Technology	Great Britain	Core	0.803366001	0.65347798	-0.149982	Lower	0.243789467	0.258474753	Higher	0.039631772	0.059681159	0.039631772	0.059681159	
RIO LN Equity	Rio Tinto PLC	Basic Resources	Great Britain	Core	1.687654248	0.690258702	-0.99739555	Lower	0.367943389	0.339483899	Lower	0.528578934	1.560784508	0.528578934	1.560784508	
ROG VX Equity	Roche Holding AG	Health Care	Switzerland	Core	0.607557342	0.848136447	0.240579105	Higher	0.182756906	0.211176745	Higher	1.951276016	2.179776392	1.951276016	2.179776392	
RR LN Equity	Rolls-Royce Holdings PLC	Industrial Goods & Services	Great Britain	Core	0.901293949	0.322593486	-0.46870046	Lower	0.197705471	0.315406681	Higher	0.370211754	0.236885967	0.370211754	0.236885967	
ROR LN Equity	ROR LN Equity	Industrial Goods & Services	Great Britain	Core	0.992272023	0.897062625	-0.0952094	Lower	0.254632316	0.351900158	Higher	0.043304877	0.03134877	0.043304877	0.03134877	
ROR LN Equity	Royal Bank of Scotland Group PLC	Banks	Great Britain	Core	2.238174599	0.826886157	-1.41128844	Lower	0.505611318	0.339480411	Lower	0.127141635	0.135435623	0.127141635	0.135435623	
RDSA NA Equity	Royal Dutch Shell PLC	Oil & Gas	Great Britain	Core	0.689075206	0.856981289	0.167906083	Higher	0.175322652	0.226849118	Higher	1.746898836	1.304039536	1.746898836	1.304039536	
RPC LN Equity	RPC Group PLC	Industrial Goods & Services	Great Britain	Core	0.908339607	0.418912572	-0.48942703	Lower	0.2247468	0.232168998	Higher	0.009	0.041452822	0.009	0.041452822	
RSA LN Equity	RSA Insurance Group PLC	Insurance	Great Britain	Core	0.739784798	0.560149155	-0.17963564	Lower	0.2114442	0.236481352	Higher	0.089019459	0.081480443	0.089019459	0.081480443	
RUI FP Equity	Rubis SCA	Rubis SCA	France	Core	0.738067018	0.706937495	-0.03112952	Lower	0.174605573	0.205510438	Higher	0.034610098	0.034610098	0.034610098	0.034610098	
RWE GY Equity	RWE AG	Utilities	Germany	Core	1.138207237	1.142498555	0.004291318	Higher	0.343323904	0.438359138	Higher	0.250380934	0.101760525	0.250380934	0.101760525	
RVA ID Equity	Ryanair Holdings PLC	Travel & Leisure	Ireland	Periphery	0.107254067	0.495132417	0.38787835	Higher	0.215712127	0.28948958	Higher	0.128201852	0.158025885	0.128201852	0.158025885	
SAAB SS Equity	Saab AB	Industrial Goods & Services	Sweden	Core	0.991823753	0.649953916	-0.34186984	Lower	0.238188558	0.20330666	Lower	0.030045579	0.030045579	0.030045579	0.030045579	
SAP FP Equity	Sapran SA	Technology	France	Core	1.025428719	1.241038433	0.21560974	Higher	0.2373299412	0.262252836	Higher	0.166225393	0.282655541	0.166225393	0.282655541	
S3T3 GY Equity	Sartorius AG	Industrial Goods & Services	Germany	Core	0.041351471	1.078056596	1.036704924	Higher	0.29058986	0.384603961	Higher	0	0.031338808	0	0.031338808	
SBM NA Equity	SBM Offshore NV	Oil & Gas	Netherlands	Core	1.523784684	1.21435161	-0.30943307	Lower	0.240723513	0.431553676	Higher	0.048013818	0.0798259	0.048013818	0.0798259	
SCHA NO Equity	Schibsted ASA	Personal & Household Goods	Norway	Core	1.105716919	0.735312898	-0.37040402	Lower	0.274038087	0.264000347	Higher	0.040973885	0.034708049	0.040973885	0.034708049	
SCHP VX Equity	Schindler Holding AG	Industrial Goods & Services	Switzerland	Core	0.691570319	0.661750703	-0.02981962	Lower	0.17765952	0.210251721	Higher	0.085295877	0.085040721	0.085295877	0.085040721	
SUI FP Equity	Schneider Electric SE	Industrial Goods & Services	France	Core	1.588520529	1.24741015	-0.34111038	Lower	0.314083854	0.25787027	Lower	0.511256689	0.467891934	0.511256689	0.467891934	
SOR LN Equity	Schroders PLC	Financial Services	Great Britain	Core	1.691745272	1.149500815	-0.54224446	Lower	0.173767053	0.238602051	Higher	0.048438869	0.057380557	0.048438869	0.057380557	
SCR FP Equity	SCOR SE	Insurance	France	Core	0.915158329	1.176142294	0.260983964	Higher	0.184656098	0.2571957	Higher	0.066563098	0.071157426	0.066563098	0.071157426	
SDRL NO Equity	Seedrill Ltd	Utilities	Norway	Core	0.54038465	2.157145965	1.6167161315	Higher	0.194153332	1.00568939	Higher	0.180776525	0.034538057	0.180776525	0.034538057	
SK FP Equity	SEB SA	Personal & Household Goods	France	Core	0.59965366	0.508085445	-0.45187992	Lower	0.251466868	0.246356118	Lower	0.030791836	0.030791836	0.030791836	0.030791836	
SECUB SS Equity	Securitas AB	Industrial Goods & Services	Sweden	Core	0.896542413	1.05363198	0.157090785	Higher	0.251892508	0.279622948	Higher	0.039468425	0.055768311	0.039468425	0.055768311	
SGRO LN Equity	Segro PLC	Real Estate	Great Britain	Core	1.27519408	0.534196107	-0.74099797	Lower	0.253726274	0.181378016	Lower	0.040663689	0.054643984	0.040663689	0.054643984	
SRP LN Equity	Serco Group PLC	Industrial Goods & Services	Great Britain	Core	0.615646233	1.104810704	0.489163971	Higher	0.239777105	0.44271965	Higher	0.06027672	0.019124069	0.06027672	0.019124069	
SESG FP Equity	SESSA	Media	Luxembourg	Core	0.385047749	0.327450368	-0.057627381	Lower	0.155211159	0.244848548	Higher	0.117910738	0.114312656	0.117910738	0.114312656	
SVT LN Equity	Severn Trent PLC	Utilities	Great Britain	Core	0.485175229	0.410707521	-0.07486771	Lower	0.256030726	0.187889778	Lower	0.085825257	0.088740984	0.085825257	0.088740984	
SGSN VX Equity	SGS SA	Industrial Goods & Services	Switzerland	Core	0.573844594	0.725318014	0.15147342	Higher	0.151099896	0.235375124	Higher	0.156067475	0.131821118	0.156067475	0.131821118	
SHB LN Equity	Shaftesbury PLC	Real Estate	Great Britain	Core	0.698257359	0.274238475	-0.42401888	Lower	0.184417069	0.149429581	Lower	0.029819196	0.038238836	0.029819196	0.038238836	
SHP LN Equity	Shire PLC	Health Care	Great Britain	Core	0.465252957	0.935247206	0.469994349	Higher	0.205330261	0.286414675	Higher	0.25051033	0.561367295	0.25051033	0.561367295	
SIE GY Equity	Siemens AG	Industrial Goods & Services	Germany	Core	1.095583714	1.03139071	-0.064193	Lower	0.210964895	0.214014675	Higher	1.204143656	1.028707607	1.204143656	1.028707607	
SIX VY Equity	Sila AG	Construction & Materials	Switzerland	Core	0.819403763	0.722715939	-0.09668782	Lower	0.194715418	0.276255561	Higher	0.068823574	0.102421426	0.068823574	0.102421426	
SIM DC Equity	SimCorp A/S	Technology	Denmark	Core	0.727564537	0.899840998	0.172319961	Higher	0.221368775	0.322788875	Higher	0	0.026094333	0	0.026094333	
SEBA SS Equity	Skandinaviska Enskilda Banken AB	Banks	Sweden	Nordic	1.513750184	0.892738116	-0.62101207	Lower	0.276393668	0.221198839	Lower	0.174421033	0.093734262	0.174421033	0.093734262	
SKAB SS Equity	Skanska AB	Construction & Materials	Sweden	Nordic	1.160221066	0.801871716	-0.35834389	Lower	0.225463086	0.240833897	Higher	0.097621426	0.097621426	0.097621426	0.097621426	
SKFB SS Equity	SKF AB	Industrial Goods & Services	Sweden	Nordic	1.481741867	0.562371432	-0.91937044	Lower	0.274814844	0.264526159	Lower	0.121538918	0.08606541	0.121538918	0.08606541	
SKY LN Equity	Sky PLC	Media	Great Britain	Core	0.382816656	0.8775801	0.494763444	Higher	0.185931429	0.261114085	Higher	0.167858738	0.14290148	0.167858738	0.14290148	
SM LN Equity	Smith & Nephew PLC	Health Care	Great Britain	Core	0.806586628	0.619040947	-0.187545681	Lower	0.155782481	0.217925917	Higher	0.130574066	0.18056782	0.130574066	0.18056782	
SM LN Equity	Smiths Group PLC	Health Care	Great Britain	Core	0.806586628	0.603426592	-0.20316034	Lower	0.185606197	0.209183806	Higher	0.09651967	0.079590419	0.09651967	0.079590419	
SKG ID Equity	SmithKline Beecham PLC	Industrial Goods & Services	Ireland	Periphery	1.930504001	0.64273072	-1.287769279	Lower	0.390111913	0.268812016	Lower	0.04627458	0.068466279	0.04627458	0.068466279	
SBG IM Equity	Snam SpA	Utilities	Italy	Periphery	0.689968104	0.37852473	-0.31142338	Lower	0.187163934	0.184897921	Lower	0.109104049	0.079278314	0.109104049	0.079278314	
BB FP Equity	Societe BIC SA	Personal & Household Goods	France	Core	0.590446774	0.749342183	0.158895409	Higher	0.23547032	0.203195238	Lower	0.040820049	0.047779508	0.040820049	0.047779508	

Appendix - Summary Table of Results (10/12)

Ticker	Name	Sector	Country	Region	1st Period Beta	2nd Period Beta	Beta Result	Beta Dif	1st Period Volatility	2nd Period Volatility	Volatility Result	1st P. Average Weight	2nd P. Average Weight	1st Period Beta Weight	2nd Period Beta Weight
GLE FP Equity	Société Générale SA	Banks	France	Core	2.665839218	1.620409086	Lower	-1.04523013	0.557361925	0.366100175	Lower	0.357033164	0.412568066	0.951721604	0.666839042
SW FP Equity	Sodexo SA	Travel & Leisure	France	Core	0.459765153	0.913613007	Higher	0.331596154	0.144401374	0.208512868	Higher	0.110330309	0.118324656	0.050727291	0.094637554
SOW GY Equity	Software AG	Technology	Germany	Core	1.145287456	0.652214437	Lower	-0.49307313	0.343900012	0.2411714	Lower	0.031140361	0.024050667	0.035646664	0.015982949
SO LB BB Equity	Solvay SA	Chemicals	Belgium	Core	1.117361998	0.085688484	Lower	-0.02767351	0.284988938	0.261360038	Lower	0.00099915	0.022323616	0.112852573	0.100508686
SOON VX Equity	Sonova Holding AG	Health Care	Switzerland	Core	0.669440131	0.625384565	Lower	-0.04074557	0.275682483	0.236658396	Lower	0.076271197	0.088891967	0.048654486	0.055591263
SOX LN Equity	Spectris PLC	Industrial Goods & Services	Great Britain	Core	1.404733035	0.88045107	Lower	-0.52428228	0.324099083	0.263546594	Lower	0.04174318	0.046787937	0.064787937	0.075582828
SPX LN Equity	Spirax-Sarco Engineering PLC	Industrial Goods & Services	Great Britain	Core	1.007976646	0.807784006	Lower	-0.20019264	0.327988049	0.220869444	Lower	0.037900934	0.044446361	0.038203257	0.035660724
SPD LN Equity	Sports Direct International PLC	Retail	Great Britain	Core	0.480451504	0.719806067	Higher	0.239529162	0.138257229	0.393064321	Higher	0	0.026137548	0.012557824	0.018818529
SSE LN Equity	SSE PLC	Utilities	Great Britain	Core	0.313314065	0.496391543	Higher	0.183077477	0.231407057	0.196549933	Higher	0.28948	0.258209066	0.090698156	0.128172796
STJ LN Equity	St James's Place PLC	Insurance	Great Britain	Core	1.426566236	1.096188134	Lower	-0.3307781	0.27683327	0.247123269	Lower	0.041548909	0.081943754	0.05927271	0.089825771
SAZ GY Equity	STADA Arzneimittel AG	Health Care	Germany	Core	0.688090943	0.941831883	Higher	0.252922041	0.385524622	0.2765812	Higher	0.03117344	0.019556547	0.029307307	0.029307307
SGC LN Equity	Stagecoach Group PLC	Industrial Goods & Services	Great Britain	Core	0.427175661	0.703629275	Higher	0.276453614	0.238295735	0.265686569	Higher	0.027282262	0.024954667	0.011654318	0.017558834
STAN LN Equity	Standard Chartered PLC	Banks	Great Britain	Core	1.324097902	1.150720458	Higher	-0.17333744	0.26185844	0.363108619	Higher	0.04211246	0.292311246	0.850290002	0.336868931
SLA LN Equity	Standard Life PLC	Insurance	Great Britain	Core	1.116087422	0.828399946	Lower	-0.28768748	0.267137251	0.252594566	Lower	0.14418777	0.139422443	0.160926157	0.110571744
STM LN Equity	Stanol ASA	Oil & Gas	Norway	Nordic	0.557810379	0.874017648	Higher	0.316207289	0.17240072	0.3217477	Higher	0.364783781	0.120537148	0.203480183	0.184001383
STM IM Equity	STMMicroelectronics NV	Technology	Periphery	Periphery	1.281702225	1.614396877	Higher	0.332694652	0.43630325	0.40394173	Higher	0.065326131	0.06303262	0.083728648	0.107176391
STER FH Equity	Stora Enso OY	Basic Resources	Finland	Nordic	1.590697992	1.332022494	Lower	-0.2589473	0.310594361	0.305534436	Lower	0.054561934	0.063421492	0.086806389	0.084478854
STB NO Equity	Storebrand ASA	Insurance	Norway	Nordic	2.091059886	0.951825485	Lower	-1.1392344	0.44814151	0.364941744	Lower	0.023388382	0.023108955	0.049942497	0.021995692
STMN SE Equity	Streamam Holding AG	Health Care	Switzerland	Core	0.584436049	0.512823931	Lower	-0.07161212	0.295372002	0.294715537	Lower	0.019604622	0.039748667	0.0114657648	0.020378016
SUBC NO Equity	Subsea 7 SA	Oil & Gas	Norway	Nordic	0.846789143	0.913800796	Higher	0.07301653	0.276248583	0.418649532	Higher	0.086172225	0.02977869	0.072969764	0.023789707
SZU GY Equity	Suedzucker AG	Food & Beverage	Germany	Core	-0.0251832	1.047772691	Higher	1.067955893	0.293348546	0.400125327	Higher	0.032057311	0	-0.000807306	0.034248489
SEV FP Equity	Suez	Utilities	France	Core	1.318806614	0.632093382	Lower	-0.68671323	0.310385024	0.214328826	Lower	0.049612738	0.066705426	0.065429607	0.047164058
SUN SE Equity	Sulzer AG	Industrial Goods & Services	Switzerland	Core	1.191199264	0.489386008	Lower	-0.70181326	0.27639476	0.261731033	Lower	0.0255898	0.048529458	0.01252329	0.01252329
SCAB SS Equity	Svenska Cellulosa AB SCA	Personal & Household Goods	Sweden	Nordic	0.866859414	0.704178363	Lower	-0.16268105	0.217424677	0.236000991	Higher	0.166990213	0.198546148	0.144757038	0.139811901
SHBA SS Equity	Svenska Handelsbanken AB	Banks	Sweden	Nordic	1.317177854	0.749999644	Lower	-0.56717821	0.297245366	0.241882058	Lower	0.238756787	0.24824423	0.281073415	0.224989834
UHR VX Equity	Swatch Group AG/The	Personal & Household Goods	Switzerland	Core	1.468273505	0.934066103	Lower	-0.5342074	0.316793736	0.30794858	Lower	0.205962869	0.131569672	0.302409823	0.122804771
SWEDA SS Equity	Swedbank AB	Banks	Sweden	Nordic	1.49099194	0.979364185	Lower	-0.51162776	0.288284047	0.2254834	Lower	0.293343444	0.253868131	0.341207429	0.246670627
SWMVA SS Equity	Swedish Match AB	Personal & Household Goods	Sweden	Nordic	0.071030435	0.527523889	Higher	0.456493455	0.220661084	0.169571691	Higher	0.07572852	0.07572852	0.007567333	0.039982854
SOBI SS Equity	Swedish Orphan Biovitrum AB	Health Care	Sweden	Nordic	1.004048718	0.928397766	Lower	-0.07565095	0.412313317	0.368185266	Lower	0	0.025849889	0.029545448	0.02998979
SU LN VX Equity	Swiss Life Holding AG	Insurance	Switzerland	Core	1.317177854	0.749999644	Lower	-0.56717821	0.297245366	0.241882058	Lower	0	0.025849889	0.068140266	0.071671294
SPSN SW Equity	SPSN Swiss Prime Site AG	Real Estate	Switzerland	Core	0.241706722	0.436239007	Higher	0.194532285	0.121222096	0.160829294	Higher	0.065126902	0	0.015258196	0.027538417
SREN VX Equity	Swiss Re AG	Insurance	Switzerland	Core	0.938073637	0.800500521	Lower	-0.12757312	0.198538791	0.211502113	Higher	0.313435885	0.362468492	0.290891582	0.290156217
SCMNX VX Equity	Swisscom AG	Telecommunications	Switzerland	Core	0.573668275	0.728238542	Higher	0.154957066	0.146713184	0.179604387	Higher	0.130803262	0.154635325	0.075037682	0.112726782
SYDB DC Equity	Sydbank A/S	Banks	Denmark	Nordic	0.761084363	0.771340568	Higher	0.010236205	0.244657901	0.246108373	Higher	0.019523016	0.027858885	0.014858662	0.014858662
SY1 GY Equity	Symrise AG	Chemicals	Germany	Core	0.339417798	0.780365651	Higher	0.440947853	0.170319323	0.205991028	Higher	0.051679361	0.094249213	0.017540895	0.073548849
SYNN SW Equity	Syngenta AG	Chemicals	Switzerland	Core	0.689960821	0.495802702	Lower	-0.19015812	0.182292227	0.272643587	Higher	0.467655311	0.427417475	0.322663843	0.213624409
TALK LN Equity	Talktalk Telecom Group PLC	Telecommunications	Great Britain	Core	0.349684603	0.719809055	Higher	0.370124452	0.288859528	0.367554549	Higher	0.023623778	0.025294764	0.008260871	0.0182074
TATE LN Equity	Tate & Lyle PLC	Food & Beverage	Great Britain	Core	0.198582534	0.497516496	Higher	0.298839862	0.154035617	0.280413777	Higher	0.070242369	0.049670328	0.01474395	0.024711807
TW/ LN Equity	Taylor Wimpey PLC	Personal & Household Goods	Great Britain	Core	1.189480325	0.466701204	Lower	-0.73377912	0.313478332	0.313422423	Lower	0.044343803	0.094260803	0.053145176	0.043803109
TDC DC Equity	TDC A/S	Telecommunications	Denmark	Nordic	0.525006835	0.678210796	Higher	0.153203982	0.166876522	0.274004229	Higher	0.051495066	0.056843197	0.027095261	0.038515167
TELEZ AB Equity	Tele2 AB	Telecommunications	Sweden	Nordic	0.710433363	0.623335825	Lower	-0.08708754	0.312139336	0.25025752	Lower	0.072228115	0.03683672	0.051313262	0.029290914
TIT IM Equity	Telecom Italia SpA/Milano	Telecommunications	Italy	Periphery	1.313821239	1.241887679	Lower	-0.07193356	0.390263961	0.321676455	Lower	0.138499803	0.134481738	0.181963983	0.167101213
ERIC SS Equity	Telefonaktiebolaget LM Ericsson	Technology	Sweden	Nordic	0.935999368	0.640283682	Lower	-0.29571569	0.254589355	0.351861473	Higher	0.443139869	0.327671033	0.414778637	0.209802415
TEF SO Equity	Telefonica SA	Telecommunications	Spain	Periphery	1.2123330153	1.2123330153	Lower	-0.13527279	0.300857846	0.291988316	Lower	0.850702	0.607705088	1.146369809	0.736729215
TKA AV Equity	Telekom Austria AG	Telecommunications	Austria	Core	0.78145261	0.668934358	Lower	-0.11251825	0.326454327	0.286629777	Lower	0.031613344	0.010515667	0.024351114	0.007034291
TNET BB Equity	Telenor Group Holding NV	Media	Belgium	Core	0.899259035	0.717633029	Higher	0.328373994	0.222217483	0.195618835	Higher	0.034210721	0.033974459	0.013316832	0.022945928
TEL NO Equity	Telenor ASA	Telecommunications	Norway	Nordic	0.607417897	0.924408929	Higher	0.316991032	0.180972452	0.239039547	Higher	0.193072852	0.148985426	0.117275906	0.137723458
TEP FP Equity	Teleperformance	Industrial Goods & Services	France	Core	1.256070938	0.577766845	Lower	-0.49830409	0.291677613	0.216224934	Lower	0.02428662	0.056651197	0.030505968	0.042905899
TFI FP Equity	Television Francaise 1	Media	France	Core	1.730497991	0.97988943	Lower	-0.75060856	0.429136553	0.296116744	Lower	0.0220093433	0.02101196	0.034771646	0.0205956884

Appendix - Summary Table of Results (11/12)

Ticker	Name	Sector	Country	Region	1st Period Beta	2nd Period Beta	Beta Diff	Volatility	1st Period Volatility	2nd Period Volatility	Volatility Result	1st P. Average Weight	2nd P. Average Weight	1st Period Beta X 1st P. Average Weight	2nd Period Beta X 2nd P. Average Weight
TELA SS Equity	Telia Co AB	Telecommunications	Sweden	Nordic	0.753258314	0.793898815	Higher	0.040105001	0.178175876	0.211778777	Higher	0.2029203607	0.153420694	0.1157584356	0.1223475999
TEMA SS Equity	Temnos Group AG	Technology	Switzerland	Core	0.674308898	0.86872901	Lower	0.475971959	0.836253451	0.362534851	Lower	0.018542767	0.043200406	0.031046319	0.037529466
TEN IM Equity	Tenaris SA	Basic Resources	Italy	Periphery	0.3103332656	0.803222758	Lower	-0.67210987	0.3103332656	0.8314139855	Lower	0.127098599	0.07765282	0.187512697	0.062372512
TOMA SS Equity	Terna Rete Elettrica Nazionale Spa	Utilities	Italy	Periphery	0.803410956	0.496698532	Lower	-0.31271246	0.206827729	0.164508938	Lower	0.070963039	0.082009803	0.057010558	0.040286253
TSCO LN Equity	Tesco PLC	Retail	Great Britain	Core	0.115188827	0.581989483	Higher	0.03817524	0.20370691	0.332789221	Higher	0.608688656	0.256515125	0.28717006	0.129136402
TCSO LN Equity	TCS NOPEC Geophysical Co ASA	Industrial Goods & Services	Great Britain	Core	1.476188327	1.02021	Lower	-0.21317833	0.30832732	0.135829228	Higher	0.04206349	0.32407052	0.046909895	0.055460718
THAS SA	Thales SA	Travel & Leisure	France	Core	1.085573927	0.675013864	Lower	-0.11055011	0.204348643	0.21307145	Lower	0.051336949	0.093239834	0.08729079	0.063808148
HCO LN Equity	Thomas Cook Group PLC	Travel & Leisure	Great Britain	Core	1.483131253	0.6450779443	Lower	-1.83733307	0.965677182	0.37407145	Lower	0.123408836	0.082875021	0.078325134	0.083804143
TGK SS Equity	thyssenkrupp AG	Industrial Goods & Services	Germany	Core	2.038807827	1.451665221	Lower	-0.57712465	0.440229219	0.343055935	Lower	0.028160459	0	0.023848385	0.017269459
TOD LC Equity	Tod's SPA	Personal & Household Goods	Italy	Periphery	1.137997039	0.823830773	Lower	-0.31760017	0.298039389	0.295107772	Higher	0.028160459	0	0.023848385	0.017269459
TOTAL SA	TODAL SA	Oil & Gas	France	Core	1.040604606	0.966449639	Lower	-0.073760017	0.139408017	0.220436441	Higher	1.371321	1.419008443	1.39342393	1.374400197
TRB SS Equity	Travis Perkins PLC	Industrial Goods & Services	Great Britain	Core	1.240106046	0.482376519	Lower	-0.75792989	0.2748912704	0.22060789	Higher	0.061336311	0.0530820426	0.076063553	0.036850973
TRG DC Equity	Treilborg AB	Industrial Goods & Services	Sweden	Nordic	1.6688632	0.968277017	Lower	-0.69869093	0.321935045	0.251050592	Lower	0.024608171	0.009628743	0.009628743	0.027498817
TRV DC Equity	Tryg A/S	Travel & Leisure	Denmark	Core	1.988375218	1.004255888	Lower	-1.25127715	0.415987335	0.256817644	Higher	0.253781852	0.04209759	0.253781852	0.04209759
TUJ LN Equity	TUI AG	Travel & Leisure	Great Britain	Core	0.881757999	1.020434372	Higher	0.13327673	0.316346794	0.167111112	Higher	0	0.033982371	0.022560687	0.051425251
TUW LN Equity	Tullow Oil PLC	Oil & Gas	Great Britain	Core	0.663890898	1.513292008	Higher	0.849401109	0.331431398	0.39095283	Lower	0.033676902	0.04148131	0.041491739	0.024435715
UBM LN Equity	Ubisoft Entertainment SA	Media	France	Core	1.232053337	0.86718151	Lower	-0.64533159	0.2574169	0.00985485	Higher	0	0	0.041491739	0.024435715
UBS LN Equity	UBS Group AG	Banking	Switzerland	Core	1.304187856	1.150824977	Lower	-0.15386288	0.31957332	0.37029931	Higher	0.073050541	0.115817262	0.951219107	0.838998073
UCB LN Equity	UCB SA	Health Care	Belgium	Core	0.592322068	0.652857505	Higher	0.057625437	0.244426042	0.65658358	Higher	0.073050541	0.115817262	0.043482025	0.075612169
ULI LN Equity	Ultra Electronics Holdings PLC	Industrial Goods & Services	Great Britain	Core	1.051084627	0.313703432	Lower	-0.74738119	0.269431755	0.209278682	Lower	0.024890803	0.021487131	0.026411249	0.006740487
UMI BB Equity	Umico SA	Chemicals	Belgium	Core	1.191402606	0.736530094	Lower	-0.45487251	0.273420577	0.28213733	Lower	0.074704262	0.05627361	0.089002853	0.04144987
UL MA Equity	Unibail-Rodamco SE	Real Estate	France	Core	1.079163859	0.988103511	Lower	-0.18106033	0.29833213	0.24828259	Lower	0.28500695	0.30264026	0.307569194	0.271802209
ULG IM Equity	Unicredit SPA	Banking	Italy	Periphery	2.041904199	1.251318006	Lower	-0.7905529	0.643295864	0.76557558	Lower	0.338469279	0.17032738	0.691121842	0.366709068
UNA MA Equity	Unilever NV	Personal & Household Goods	Netherlands	Core	0.513069472	1.054038405	Higher	0.54124865	0.147776575	0.24843177	Lower	0.86561246	0.802275148	0.490052359	0.846390865
UNA LN Equity	Unilever PLC	Personal & Household Goods	Great Britain	Core	0.457107043	0.654114505	Higher	0.077246266	0.491538773	0.550147418	Higher	0.661049377	0.67989077	0.302170882	0.404565003
UBI IM Equity	Unione di Banche Italiane SPA	Banking	Italy	Periphery	1.623762921	1.706010187	Higher	0.077246266	0.491538773	0.550147418	Higher	0.052006311	0.0546897443	0.087166004	0.097067617
USM Equity	UnipolAssicurazioni SPA	Insurance	Italy	Periphery	1.623762921	1.706010187	Higher	0.077246266	0.491538773	0.550147418	Higher	0	0.027212033	0.016640577	0.031835402
UTD LC Equity	United Internet AG	Technology	Germany	Core	0.897993407	1.69516842	Higher	0.558201617	1.302419562	0.358635954	Lower	0.09693623	0.108593787	0.028968973	0.061778149
UJ LN Equity	United Utilities Group PLC	Utilities	Great Britain	Core	0.638956608	0.347320046	Higher	0.075194518	0.200483001	0.276870854	Lower	0.087053885	0.117377787	0.20839423	0.122380642
UPM FH Equity	UPM-Kymmene OY	Basic Resources	Finland	Core	1.386095142	1.041173216	Lower	-0.34467273	0.319299398	0.197587455	Lower	0.087053885	0.117377787	0.20839423	0.122380642
FRP Equity	Valeo SA	Automobiles & Parts	France	Core	1.887005166	1.212898661	Lower	-0.66465431	0.357928581	0.296271528	Higher	0.087053885	0.117377787	0.20839423	0.122380642
VK FP Equity	Vallourec SA	Utilities	France	Core	1.887005166	1.212898661	Lower	-0.66465431	0.357928581	0.296271528	Higher	0.087053885	0.117377787	0.20839423	0.122380642
VIE FP Equity	Veolia Environment SA	Utilities	France	Core	1.887005166	1.212898661	Lower	-0.66465431	0.357928581	0.296271528	Higher	0.087053885	0.117377787	0.20839423	0.122380642
VES DC Equity	Vestas Wind Systems A/S	Oil & Gas	Denmark	Core	1.161324919	0.714347497	Lower	-0.44697742	0.345723841	0.217997437	Lower	0.0384154	0.16129852	0.056277171	0.192599639
VCT LN Equity	Victrix PLC	Food & Beverage	Denmark	Core	1.469563809	0.946102921	Lower	-0.52721609	0.250087775	0.2169675598	Lower	0.0384154	0.16129852	0.056277171	0.192599639
VIG AV Equity	Vienna Insurance	Insurance	Austria	Core	0.99291828	0.969575742	Lower	-0.02721609	0.250087775	0.2169675598	Higher	0.02608482	0.025657852	0.025883753	0.024877231
DG FP Equity	Vind SA	Construction & Materials	Austria	Core	1.472463529	1.15520671	Lower	-0.31755682	0.271766687	0.296809909	Higher	0.024170262	0.01843625	0.03558983	0.02129768
VS LN Equity	Viscofan SA	Construction & Materials	France	Core	1.408567326	0.702740013	Lower	-0.70582731	0.265956687	0.179958625	Higher	0.348939541	0.429554869	0.491504836	0.301865394
VIV FP Equity	Vivendi SA	Media	France	Periphery	0.317299955	0.684626424	Higher	0.367326469	0.169579965	0.197777367	Lower	0.028605059	0.028734295	0.009093978	0.019672258
VOD LN Equity	Vodafone Group PLC	Telecommunications	Great Britain	Core	0.965024538	0.800202611	Higher	0.015178073	0.261740631	0.22892432	Higher	0.363804541	0.108053115	0.351083009	0.301954467
VOE AV Equity	voestalpine AG	Basic Resources	Austria	Core	1.443978234	0.619462626	Higher	0.17484392	0.174093492	0.201326823	Higher	1.967110016	0.989661148	0.877354031	0.618633257
VOW3 GV Equity	Volkswagen AG	Automobiles & Parts	Germany	Core	1.728093445	0.894152048	Lower	-0.8339414	0.359886754	0.297179244	Lower	0.050882623	0.047848967	0.087929927	0.047784252
VOLV SS Equity	Volvoo AB	Automobiles & Parts	Sweden	Core	1.690574905	1.249748773	Lower	-0.44082613	0.324935733	0.257325939	Higher	0.386784689	0.133330885	0.653888488	0.416579865
WRTV FH Equity	Wartsila OY /Abp	Industrial Goods & Services	Finland	Nordic	1.622390903	0.839346041	Lower	-0.7884486	0.306368771	0.277325939	Higher	0.26157359	0.208272623	0.434374613	0.1727896024
WEIR LN Equity	Weir Group PLC/The	Industrial Goods & Services	Great Britain	Core	1.07065889	0.956646433	Lower	-0.11437046	0.30055058	0.26217861	Lower	0.086968656	0.086589967	0.083140464	0.077096024
WIP FP Equity	Wendell SA	Financial Services	France	Core	1.99333342	0.99915213	Lower	-0.99916031	0.34748604	0.28370925	Higher	0.04443066	0.04179279	0.028317022	0.04179279
WHA MA Equity	Wendell NV	Industrial Goods & Services	Netherlands	Core	1.110023274	0.808672503	Lower	-0.3035071	0.298788705	0.21532374	Lower	0.020845623	0.025947262	0.03139127	0.020204039
SMWH LN Equity	WH Smith PLC	Retail	Great Britain	Core	0.520956112	0.512302006	Lower	-0.00865411	0.207957606	0.194159013	Higher	0	0.031128115	0.016216382	0.019596996
WHLN LN Equity	Whitbread PLC	Travel & Leisure	Great Britain	Core	0.549715455	0.808827039	Higher	0.25691384	0.18686004	0.295427929	Higher	0.019065267	0.024883632	0.039414041	0.02412169
WIE AV Equity	Wiemannberger AG	Construction & Materials	Austria	Core	1.592591517	0.969018131	Lower	-0.62649103	0.370308111	0.211551008	Higher	0.028362613	0.02579939	0.013895754	0.008170678
WDH DC Equity	William Demant Holding A/S	Health Care	Denmark	Nordic	0.8038855	0.740003327	Higher	0.24961272	0.108968122	0.131025308	Higher	0.052370045	0.05129367	0.028052636	0.021938847
WMI GV Equity	William Hill PLC	Travel & Leisure	Great Britain	Core	0.532000432	0.427746413	Lower	-0.10751402	0.254223285	0.255810591	Higher	0.033818706	0.06182741	0.007756619	0.037397722
WRG LN Equity	Wm Morrison Supermarkets PLC	Retail	Great Britain	Core	0.341297926	0.604872862	Higher	0.375514071	0.184126069	0.27683683	Higher	0.15437328	0.075299459	0.62560675	0.032441244
MRV LN Equity	Wobley PLC	Industrial Goods & Services	Great Britain	Core	1.070940627	0.44143559	Lower	-0.62967907	0.231078164	0.270492226	Lower	0.154748977	0.178832131	0.18441171	0.097310352
WKL MA Equity	Wolters Kluwer NV	Media	Netherlands	Core	1.025256851	0.8702252924	Lower	-0.15230093	0.201747957	0.236052307	Higher	0.082158377	0.127045508	0.084009147	0.123262466
WPP LN Equity	WPP PLC	Media	Great Britain	Core	1.01947212	0.858479347	Lower	-0.16099277	0.199693161	0.196611146	Higher	0.24973059	0.352535508	0.254593374	0.302444463
ATK LN Equity	Wysatms PLC	Financial Services	Great Britain	Core	0.61547164	0.276932774	Higher	0.111461134	0.289273914	0.262331056	Lower	0	0	0.015501148	0.018308386
YAR LN Equity	Yara International ASA	Chemicals	Norway	Nordic	1.2905421	0.77887284	Lower	-0.51866482	0.308270184	0.2606438	Lower	0.116093738	0.081012443	0.149823856	0.062531864
ZOT SQ Equity	Zodiaq Ois SA	Industrial Goods & Services	Spain	Periphery	0.463980018	1.259811409	Higher	0.788332121	0.192159992	0.300708084	Higher	0.028066951	0.022266636	0.013022508	0.027776314
ZC FP Equity	Zodiac Aerospace	Industrial Goods & Services	France	Core	0.513330947	1.035861687	Higher	0.502552218	0.201520164	0.4952737	Higher	0.0574782	0.062662378	0.030651866	0.069102977
ZURN VX Equity	Zurich Insurance Group AG	Insurance	Switzerland	Core	0.979284628	0.88591307	Lower	-0.09337156	0.211124324	0.260981835	Higher	0.056183148	0.485550625	0.495697375	0.430155556

Appendix - Summary Table of Results (12/12)