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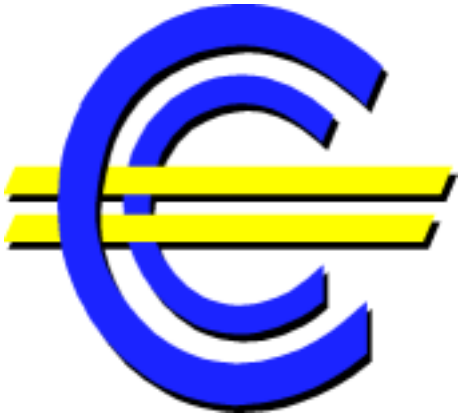

THE TRANSFORMATION OF THE EUROPEAN FINANCIAL SYSTEM

CONFERENCE PAPER

EUROPEAN FINANCIAL INTEGRATION AND EQUITY RETURNS: A THEORY-BASED ASSESSMENT

Kpate Adjaouté and Jean-Pierre Danthine

European Financial Integration and Equity Returns: A Theory-Based Assessment*

Kpate Adjaouté
HSBC Republic Bank (Suisse) SA & FAME

and

Jean-Pierre Danthine
HEC-University of Lausanne, CEPR & FAME

Abstract

This paper reassesses, at the light of economic and financial theory, the well documented recent evolution of the euro area public debt and equity markets. Doing so leads to associating the EMU and the single market with the changes in fundamentals and financial integration with convergence in pricing. For the public debt market, we stress the observation, conform with predictions, that risk free interest rates are now less volatile in the euro area. But also the fact that the establishment of a single public debt market is still not completed. The current fragmentation is costly to Treasuries and tax payers and understanding its cause is important to evaluate the prospects of currently considered measures of financial integration.

Theory predicted that the single currency would have a minor impact on equity markets since the currency component in euro area equity returns has historically been small. That the asset management industry has undergone a paradigmatic change, moving from a top-down country-based allocation to a top-down global sector-based allocation, is a puzzle in this light. A careful examination of the changing relative importance of country and industry factors for equity returns provides some weak rationale for the change in paradigm. A more complete assessment of the evolving nature of equity returns in terms of portfolio efficiency strengthens this evidence.

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Executive Summary

1. Scope of the paper

This paper tallies the progress of European financial integration in the light of financial theory. We focus on the return on European equities which we naturally decompose into a risk free rate and an equity risk premium. We study the extent to which the fundamentals underlying public bonds - a proxy for the former - and equities have been altered and whether the pricing of these assets has converged under the combined influence of the single market, the euro and other measures fostering financial integration.

2. Characterizing the changes from an institutional perspective

We first note that, from an institutional viewpoint, the current state of European financial integration is very much one of a glass that may be seen as half-full or half-empty. Clearly, the advent of the single currency and the accompanying measures of integration do constitute a lowering of the effective barriers to free investing across the euro area. However, significant barriers to a truly unified financial market continue to exist and progress often appears to be painfully slow. We also point out that, from a theoretical angle, EMU has often been deemed a minor event for equity markets, as currency risk was not found to be a major component of equity returns.

3. The impact on public debt markets and risk free rates

Against this background, we study the fundamentals and the pricing structure of the risk free asset in the euro-area. A single risk free rate is the hallmark of a truly integrated financial area and, at this level, it appears that major progress has been made. The disappearance of currency risk has eliminated the major discrepancy between bonds issued by governments with identical credit rating in the euro-area. And with identical inflation rates resulting from a single monetary policy, the fundamentals of the participating countries government bonds have fully converged. The same approximate risk-free asset is thus available to all euro-area residents. The low inflation level targeted and delivered by the ECB moreover implies that the approximation is fairly close. Finally, the Maastricht Treaty and attending restrictions on fiscal policies signal the intention to push the convergence even further, at the level of credit risk. Thus in terms of the fundamentals of government securities and the availability of an unambiguously defined risk-free asset, the euro is indeed a watershed.

In line with this assessment, euro-area government bond yields are now closer in levels, display a higher degree of correlation and, in addition, are more stable than ever before.

Yet the observed evolution seems to be entirely attributable to the convergence of fundamentals. Significant deviations from the law of one price remain. In particular, same credit rating public bonds show yield differences as large as 30 basis points and correlations between yields or holding-period returns on these instruments are smaller than unity. These pricing differences reflect a failure of integration; they are not consistent with a single public debt market and their cost to euro-area Treasuries, which may be as high as € 5 billion annually, appears unnecessary. Which additional measures of financial integration, if any, would be sufficient to eliminate them and whether the currently contemplated measures will succeed in doing so is an important question for research. In the absence of a convincing positive answer, the debate on the establishment of a multilateral agency in charge of issuing debt on behalf of the euro-area governments should be reopened.

4. The equity markets under EMU

The fundamentals underlying equities have been affected in a more settle way. With a single monetary policy, closely aligned interest rates, and fiscal policies subject to a common discipline, the macroeconomic influences on company profits are clearly converging. However, another influence may also be at work in the euro area because the lowering of barriers to trade goods and financial assets tend to permit and promote more specialization in national industrial structures. The macroeconomic evidence appears to support the view that the former influence dominates the latter and that, on this score, the fundamentals of equities are converging. In terms of pricing this result may be the counterpart of the reported decrease in the relative importance of country factors in determining returns. The evidence on this score is not unambiguous, however. At the pricing level we also show that one sufficient condition for the lowering of the equity risk premium and the cost of equity capital in response to integration has been fulfilled.

Because the undergoing changes imply new investment and risk sharing opportunities, one would expect the evidence for financial integration to be forthcoming at the level of quantities, i.e. of investment flows. Indeed the impact of these changes on the structure and performance of European financial markets and the benefits obtained by Europeans depend on the extent to which new arbitrage opportunities are seized by market participants. For this reason we also focus on the evidence that portfolio flows have been affected. We typify portfolio investment flows to and from the euro area in the context of quantity adjustments and discuss the growing role of passive investment strategies. Not surprisingly and in line with previous observations, we find weak evidence of significant changes. Market conditions since the inception of the euro have been so extra-ordinary

that their impact on investor behavior is likely to have more than offset other adjustments motivated by the structural changes. For this reason, we look beyond the observed quantity adjustments and discuss investment processes. Indeed, at this level, the asset management industry appears to have undergone a paradigmatic change that is not in line with the ex-ante assessment of the euro as a minor event and which may have an important impact on the degree of international diversification within the euro-area.

5. The new asset allocation paradigm

It is common practice among portfolio managers to follow a top-down approach to asset selection. The first step of the top-down approach traditionally consisted in deciding on a country allocation grid, effectively placing first priority on an adequate geographical diversification of portfolios. The second step consisted in selecting the best securities in accord with this allocation, that is, within each national market to the extent permitted by the grid. This practice can be placed in the context of the discussion on the relative importance of country vs. industry or sector factors in explaining the cross-section of international returns. The standard position arguing that country factors were dominant supported the geographical slant of the top-down approach. The argument is now made that the country orientation of the top-down approach should give way, within the euro-area at least, to an industry or sector orientation. According to this view, the first step of the portfolio optimization should be undertaken at the industry level.

We proceed to a detailed evaluation of the merit of this change and of what it might tell us on the determinants of equity returns. We focus on measures of correlation among industry or country indices (portfolios) showing the methodological equivalence of this more flexible approach with the standard Heston-Rouwenhorst methodology based on factors. The latter indeed appears to be overly sensitive to data sources and time periods. In the end, our approach and our data confirm the emerging superiority of industry portfolios over country portfolios, thus providing supporting evidence in favor of the change in asset allocation paradigm. We consider this evidence to be relatively weak, however, because the incriminated relationships are highly time varying. Furthermore, the responsibility of European financial integration for this reversal is placed in doubt by new evidence that a similar superiority of industry portfolios over country portfolios also characterized an earlier time period.

6. A mean-variance-based assessment of the new paradigm

We next search for confirming evidence of our results in a full mean-variance optimization. Our goal is to provide a more complete account of the observed evolutions

of equity returns in terms of portfolio efficiency and check if it supports the change in asset allocation paradigm. We do this with utmost caution realizing that the assumption that average realized returns are truly representative of ex-ante expected returns is very debatable.

We find that the Sharpe ratio of the optimal portfolios composed on the basis of sector indices has been superior to the Sharpe ratio of the optimal portfolios made of country indices since 1995. In this sense, standard mean-variance analysis provides stronger support to the changing asset allocation paradigm. There is a distinct possibility that portfolio weights implicit in sector indices have been more conducive to portfolio performance than the portfolio weights implicit in country indices since the Maastricht Treaty. And the euro has facilitated taking account of its implications for portfolio management.

Yet, full optimization also confirms another strand of research arguing that the cost of the standard aggregated approach may well be substantial in terms of portfolio performance. That is, a superior portfolio performance can be consistently achieved at a higher level of disaggregation by implementing a full optimization across portfolios identified by both country and sector components. To make sense of this, one has to assume that a two-step allocation is costlier than a one-step strategy. While these costs may be understood when placed in the larger context of the costs of doing active portfolio management in a multi-industry international setting, they are hard to rationalize in the context of passive strategies. The growth of indexing and the development of ETFs may be highly relevant in this context and augur of significant performance improvement for European investors.

7. Impact on home bias

The change in asset allocation paradigm we focus on may have some indirect effects on the home bias. The optimists will argue that the new sectoral approach to asset allocation is a strong antidote to the home bias. This is because global sector indices are by definition impervious to national considerations and the reliance on these indices at the first stage of the asset allocation process will automatically force investors towards a more international outlook. The pessimists will argue on the contrary that once the optimal sector allocation has been defined, it will be natural for investors to try to fill in the grid with home stocks belonging to the required industries, something that will be possible in a majority of cases. Of course, doing so systematically would lead to going further away from an optimal geographical diversification.

8. Who gains, who loses?

Treasuries of the euro area have been the clearest winners of financial integration. But substantial additional gains may be forthcoming from the complete unification of the public debt market. Debt markets are zero sum games, however, and if governments pay less on the securities they issue, the holders of these securities also receive less. These are likely to be the more risk averse investors who hold a disproportionate share of government securities in their portfolios. They are also the future retirees whose pension funds produce smaller returns.

The conditions for firms to benefit via a reduction of the cost of equity capital are met as well. Ceteris paribus, firms should also benefit from the observed reduction of the risk free rate. One expects this to be favorable for investment and output and for economic growth. This is not a zero-sum game and everyone will benefit from these developments, among others, the holders of claims on non-capitalized pension schemes. The importance of microstructure considerations in the case of highly homogeneous assets such as public bonds suggests similar considerations are also at work, probably with more force, in the case of equities. There are strong reasons to believe that the current fragmentation of stock exchanges in Europe implies that firms with similar characteristics are priced differently and, as a consequence, experience a cost of equity capital that varies. Such differences introduce costly distortions in the allocation of investments.

For investors, financial integration represents an improvement in diversification opportunities. One of the most obvious positive changes brought about by the euro was the automatic lifting of currency matching rules for institutional investors. Important gains in diversification, ultimately reaped by investors and consumers, are expected from this change and the evidence confirms that the new opportunities are being exploited.

1. Introduction

Several structural changes of first-order importance for financial markets in the euro-area have marked the last decade. The single market has seen an unprecedented movement of economic convergence across the European continent culminating with the advent of the euro. A broad set of measures promoting financial integration has been implemented with the view of eliminating the last objective sources of market segmentation. All these have taken place in a context of increasing globalization, that is, the removal of worldwide barriers to the free mobility of goods and capital. These structural changes and their effects, observed or anticipated on financial markets, have been abundantly documented. The facts have been recently summarized in reports issued by the ECB (ECB 2001a,b) and broad assessments of the evolution of European financial markets have been provided by Adam et al. (2002) and Galati and Tatsaronis (2001) among others. Earlier evaluations were provided by Adjaoute et al. (2000) and Danthine et al. (2001). We will build on these studies without attempting to replicate their broad range. Our main focus will be equity markets whose evolution we will try to understand in light of economic and financial theory. Because a full appreciation of equity returns requires a view on the changes in the risk free rates of return, we will also describe and evaluate the changes that have been taking place in the government bond markets of the euro area.

Our starting point is the postulate that the above mentioned changes have had a significant impact on the fundamentals being priced in European financial markets and on the characteristics of the pricing mechanism. Our goal will be to tally the progress made thus far on both fronts – To what extent have the fundamentals been modified? Are we converging toward a single pricing structure, the characteristics of a truly integrated market? -, to evaluate the role of the different structural changes for the observed developments – we will mostly associate the single market and EMU with changes in the fundamentals and financial integration with convergence in pricing -, and to identify the role and the importance of further efforts toward financial integration – we will argue that the remaining measures of financial integration have to be assessed at the light of our understanding of the microstructure of equity and bond markets. Special attention will be made to the criterion of universal access: are European securities increasingly accessible to all Europeans at the same price under the same terms? Indeed, the developments mentioned above imply new investment and risk sharing opportunities. Their impact on the structure and performance of European financial markets and the benefits obtained by Europeans depend on the extent to which these new arbitrage opportunities are seized by market participants.

Assessing the current status of European financial markets requires confronting the combined effects of the complete set of structural changes mentioned above within the global context. The significance of each of these changes is such that the temptation exists – and it not always resisted – of crediting it for the observed changes. While the euro provides an evident motivation to our inquiry, we shall resist the temptation to focus exclusively on this event or to attribute the entire credit of observed changes to monetary unification. Because financial markets are by essence about money, a major structural shift such as the advent of the euro may, at first sight, be expected to produce its most potent effects in the area of finance. But if the ultimate step is the creation in Europe of a completely unified financial market, the disappearance of national currencies, while a crucial step forward, is clearly not the endpoint. Moreover, even what can be considered as a watershed one-off event, the advent of the single currency, has been preceded by a period of several years of convergence.

There are other pitfalls to be avoided. One further cause for caution is that the key indicators of financial market performance are known to be fluctuating at high frequencies. Distinguishing trend breaks from short run fluctuations in order to assess the impact of a one-off structural change is arduous. This is all the more so in the case of the euro whose advent has almost coincided with the bursting of a major bubble in equity markets and the current market conditions are likely to obscure any euro-associated evidence. Furthermore, financial markets are guided by anticipations and a structural break may be hard to identify because of effects taking place in anticipation of the break. At the opposite, accompanying measures of integration have come slowly and progressively and some adjustments are still incomplete. Finally it is worth underlining that in this context the post-euro period constitutes by all possible measures a very short sample of observations. For all these reasons, caution has to be exercised before drawing conclusions and recourse to theoretical guidance is needed. Empirical analysis alone is likely to be unconvincing.

The paper proceeds as follows. Section 2 proposes a stylized interpretation of the institutional changes under review. Section 3 is devoted to understanding public bond markets while Section 4 focuses on equity markets and excess returns. Both of these sections are similarly structured: we first use theory to discuss the possible impact of European integration on the fundamentals of the assets under study (subsections 3.1 and 4.1), and on their pricing mechanism (subsections 3.2 and 4.2). We then collect relevant evidence on revealing quantity adjustments, that is changes in the supply and demand of

both assets (subsections 3.3 and 4.3), before providing a more complete assessment of the evidence obtained on risk free returns and equity returns. Section 5 draws some elements of a balance sheet for the various actors on these markets – Treasurers, firms and investor-consumers – and look at some of the challenges ahead.

2. A Stylized interpretation of the institutional changes

The single market, the euro and the accompanying measures of financial integration can be viewed as a series of steps in the transition from completely segmented national markets toward a single European financial market. Of course, neither extreme status is appropriate to describe the current state of financial markets in Europe and, in some sense, the extent to which the current situation can be described as one of integration (and whether it matters) is the very subject of our inquiry. It is also true that European financial markets of the late 1980's could not be viewed as completely segmented from one another. Most restrictions to the free movement of capital flows had been lifted by the end of the eighties and the removal of further obstacles to international investing has been on the agenda and under implementation for many years. Yet, besides currency risks, important obstacles on the route to financial integration remained that could be seen as having a determining influence on investors' behavior and, as a result, on market performance.

Those who rather see the glass as being half empty point to the obstacles to integration documented for instance by Adjaoute et al. (2000), and Bolkestein (2002). Padoa-Schioppa (1999) for example observed that "…the euro area (still split in 11 countries) has 18 large-value systems, 23 securities settlement systems and 13 retail payments systems. The United States has 2 large payments systems, 3 securities settlement systems and 3 retail payments systems." One may add that Europe has 15 stock exchanges, more than 20 derivatives markets and no national center for bond trading. Cross-border payments and securities settlement within Europe are substantially more expensive and complicated than domestic ones. Part of the problem is that while the processing of domestic trades has become highly standardized, cross-border processing is still structured and organized in a complicated and often inefficient way in almost all European countries. Settlement risk is increased by the lack of Delivery vs. Payment (DVP) mechanisms and the longer time between trade execution and completion, while custody risk is increased because of the number of intermediaries and jurisdictions involved. Part of the problem is that while the processing of domestic trades has become highly standardized, cross-border processing is still structured and organized in a complicated and often inefficient way in almost all

European countries. Settlement risk is increased by the lack of Delivery vs. Payment (DVP) mechanisms and the longer time between trade execution and completion, while custody risk is increased because of the number of intermediaries and jurisdictions involved.

Adjaoute et al. (2000) estimate that cross-border transactions cost ten to twenty times more than domestic ones: from $1 to $5 for domestic transactions as opposed to $10 to $50 for cross-border trades between European markets. A 1999 study by the European Central Bank similarly shows that fees charged to customers for domestic credit transfer rarely exceed € 0.10 to 0.15, while for cross-border transactions inside the euro-area these fees vary between € 3.5 to 26 for small amounts and between € 31 and 400 for higher amounts. "In addition to these fees, banks in some countries add extra charges (e.g. balance of payments reporting, currency conversion, SWIFT, postage and other communication charges), which may be substantial compared with basic fees" (European Central Bank, 1999). The ECB study also shows that cross-border payments need 4.8 working days on average to reach their destination, with substantial differences between countries, and that 15% of the transactions needed more than a week to be executed. By contrast, domestic payments arrive usually in one to three days.

Taxation can also be a significant barrier to cross-border investment within the euro area. One example of many for this is that, while taxes paid to foreign governments can usually be credited against domestic tax liabilities, the offset is not always perfect; in addition it may be costly and time consuming to actually obtain the tax credit. Another example concerns the legal status of some mutual funds that are not covered by double taxation agreements between European countries.

These and several other considerations, varying accounting and reporting standards in particular, imply that the euro area cannot be viewed as a homogenous investment area comparable to the United States. These problems are well recognized and substantial efforts to foster harmonization (i.e. the EU's Investment Services Directive and the Financial Services Action Plan of the European Commission) are under way. Concerning payment systems in general, EMU has certainly brought some progress; the establishment of TARGET and EURO1, the settlement systems for large transactions of the European System of Central Banks and the European Banking Association, respectively, and the implementation (in August 1999) of the EU Directive 97/5/EC of January 1997 on cross-border credit transfers are some of the most visible improvements in the wake of EMU. More generally, Bolkestein (2002) clearly indicates that full financial integration is

receiving the highest priority from the European Commission as it is viewed as an integral building-block in the establishment of the single market. The slow progress is not a coincidence or a result of negligence, however. It is largely a reflection of the sensitive political dimension of the issues at stake in a context where obstacles serve to protect domestic institutions and markets from outside competition.

At the other end of the spectrum, tenants of the hypothesis that the glass is half-full tend to focus on the watershed event constituted by the advent of the single currency. This is after all a true regime change and its effects may be far reaching. De Santis, Gérard and Hillion (1999) disagree, arguing that the disappearance of currency risk would have only a limited impact on portfolio investors. They base their view on the observation that while EMU countries' currency risk was a significant risk factor for portfolio investors in the 1990's and while investors were indeed compensated for their exposure to this source of risk, its importance has declined in the course of the decade. And non-EMU currency risk (in particular associated with the dollar) was quantitatively much larger. But their position must be qualified for a number of reasons.

First the situation of institutional investors is quite specific. Currency matching rules, that is, explicit restrictions on the ability of insurance and pension funds to invest in foreign currencies meant that the most important actors of European financial markets were constrained to home-biased portfolios for regulatory reasons. The automatic lifting of such restrictions, without transition on Jan. 1, 1999, is convincing ammunition for the hypothesis that the euro defines a structural break for European financial markets. We acknowledge, however, that pre-euro facts were not entirely supportive of this view as institutional investors did not appear to test their regulatory limits to foreign portfolio holdings (See Table 2.1).

Furthermore, the disappearance of euro-area currency risk has to be placed in the context of the well-known home bias, the tendency of investors everywhere to invest in local securities rather than taking full advantage of the possibilities for geographical diversification beyond their own residency area. While there is no agreed upon resolution to the home bias puzzle (see Lewis, 1999, for an overview), several plausible hypotheses have implications for the role of a structural change such as the single currency. Thus, the lack of international diversification may be attributed to informational (Brennan and Cao, 1997) and even psychological (Huberman, 2001) obstacles. This implies that weight should be placed on a more settle contribution of the euro: first, at the level of transparency (the unit of account function of the single currency), and the recent setting-

up of a wide range of euro-wide stock indices is relevant here, second, in fostering a sense of belonging (Europe is home) that could strengthen the mechanical effect of the elimination of currency risks on the perceived barriers to trading financial assets across the euro-area[1].

Table 2.1: Size, cross-border activity, and regulation of European pension funds and life insurers

Panel A: Pension Funds

Country	Assets in bn ECU (1993)	Assets as % of GDP (1993)	Foreign assets as % of total (1994)	Currency matching rule
Austria	n.a.	n.a.	12	50 %
Belgium	7	3.4	37	No
Finland	n.a.	n.a.	n.a.	80 %
France	41	3.4	4	No
Germany	106	5.8	6	80 %
Ireland	18	40.1	39	n.a.
Italy	12	1.2	5	33.3 %
Luxembourg	n.a.	n.a.	n.a.	n.a.
Netherlands	261	88.5	23	No
Portugal	n.a.	n.a.	6	No
Spain	10	2.2	3	No
Memo: UK	717	79.4	27	No

Panel B: Life Insurance

Country	Assets in bn ECU (1995)	Assets as % of GDP (1995)	Foreign assets as % of total (1994)	Currency matching rule
Austria	5	1.7	n.a.	80 %
Belgium	6	2.9	n.a.	80 %
Finland	6	6.3	n.a.	80 %
France	317	30.0	0	No
Germany	379	20.5	n.a.	80 %
Ireland	n.a.	n.a.	n.a.	n.a.
Italy	31	3.7	10	80 %
Luxembourg	5	37.6	n.a.	n.a.
Netherlands	138	45.6	6	80 %
Portugal	3	3.9	n.a.	80 %
Spain	18	4.2	n.a.	80 %
Memo: UK	565	67.1	15	No

Sources: As reported in Danthine et al. (2001)

[1] The very existence of the home bias might be viewed as an indication of fragmentation. In light of evidence that the home bias is also prevalent within the US – home bias at home – it is not clear, however, that too much weight should be placed on this single indicator as a measure of financial integration. See Coval and Moskowitz (1999).

In sum, it cannot be denied that the advent of the single currency and the accompanying measures of integration do constitute a lowering of the effective barriers to free investing across the euro area. Whether these measures might be decisive in delivering a truly unified financial market with the attending benefits is an empirical question to which we now turn. We find it useful to contrast the two extreme cases of full segmentation and complete integration and then to ask whether the "shade" changes observed in Europe might be understood in the light of the "color" changes that we describe.

3. A Single Risk Free Rate? Understanding Government Bond Markets

3.1 Fundamentals

Standard asset pricing views the return on equities as the sum of the return on the risk-free asset and of an equity risk premium. We find it useful to start with this distinction and examine separately the two components of stock returns. To situate quantitatively the two terms of our distinction, let us note that the historical average real return on government bonds has been around 1 to 4% while, with the exception of Italy, the real return on equities has been approximately 7-8% (Table 3.1). The volatility of equity returns is typically 2 to 3 times as high as the volatility of bond returns.

Table 3.1: Historical Returns and Volatilities - Equity and Bonds

Country	Sample period	Average returns on equities	Volatility of returns on equities	Average returns on government bonds	Volatility of returns on government bonds*
France	1973.2 1996.3	7.207	22.877	4.176	8.158
Germany	1978.4 1996.3	8.135	20.326	4.237	7.434
Italy	1971.2 1995.3	0.514	27.244	0.678	9.493
UK	1919-1994	7.314	22.675	1.516	8.812
USA	1891-1995	6.697	18.634	2.127	6.499

Note: * Volatility of excess return on government bonds over bills
Source: Campbell (1999)

The risk-free asset is defined as a security delivering a safe payoff, i.e., a payoff that is independent of the state of nature prevailing at the maturity of the contract. The risk-free asset is exempt of credit risk: this is why it is typically associated with a security issued by a government. It is exempt from inflation risk: this is why one usually thinks of it in terms

of an inflation indexed bond. In addition, it should be exempt from reinvestment risk, which implies that the maturity of the security should be defined in accordance with the horizon of the investor and that it should be traded in liquid markets.

Most euro-area countries do not offer their residents access to truly risk-free securities at all relevant horizons. Indeed, with the exception of the indexed securities offered by the French Treasury, no euro-area government proposes inflation-indexed bonds. It is also the case that in several countries of the euro-area government securities are not considered exempt from credit risk. In an international context with different currencies, exchange rate risk implies that the fundamentals underlying government bonds are not identical for the residents of different countries. This risk may be mitigated but not eliminated in a theoretical situation where flexible exchange rates would be exclusively driven by inflation differentials. Arbitrages are also possible via derivative instruments.

Despite these qualifications, short term government instruments are generally considered as the closest approximation of the risk-free asset. If we take the view that the typical equity investor is in the market for the medium or long run, however, the horizon considerations spelled out above suggest to rather focus on government bonds, a viewpoint we adopt here. If one abstracts from credit risk - we will be more careful later in this section - one may consider that, in the euro-area, the fundamental risk of government assets is almost entirely due to inflation risk. In other words, changes in monetary policies leading to changes in expected and realized inflation rates are the cause of discrepancies between the return on government bonds and the return on a truly risk free security.

From this perspective, EMU is indeed the major event it has been made into. The disappearance of currency risk has eliminated the major discrepancy between bonds issued by governments with identical credit rating in the euro-area. And with identical inflation rates resulting from a single monetary policy, the fundamentals of the participating countries government bonds have fully converged. The same approximate risk-free asset is thus available to all euro-area residents. The low inflation level targeted and delivered by the ECB moreover implies that the approximation is fairly close. Finally, the Maastricht Treaty and attending restrictions on fiscal policies signal the intention to push the convergence even further, at the level of credit risk. Thus in terms of the fundamentals of government securities and the availability of an unambiguously defined risk-free asset, the euro is indeed a watershed.

3.2 Pricing

Full financial integration implies that the law of one price applies to financial assets available across the euro-area. This means that the same discount factor is used to value uncertain but identical future cash flows (whatever their nature). Assets delivering identical cash flows fetch the same price independently of the country of origin or of any other specific characteristics. In technical jargon, the pricing kernel is one and the same across the area. In the case at hand, this means that in a truly integrated financial market, the definition of the risk-free asset is unambiguous and the pricing of this asset is single-valued. By contrast, when markets are segmented, the definition of the risk free asset is country-specific since it is not denominated in the same currency and the prices and returns of the corresponding securities are largely disconnected. The demand and supply of savings are matched country by country and the risk appetite largely depends on local circumstances. Since pricing differences cannot be arbitraged away - there is no way to trade on the basis of relative capital abundance and relative willingness to take risk -, local capital market conditions determine the interest rates on the national risk-free asset.

This analysis leads to the prediction that financial integration should be characterized by a convergence of interest rate levels as well as an increasing similarity in the time-series properties of the returns on the closest proxy to the risk-free asset. While even under segmentation one does not necessarily expect interest rate correlations to be zero because contagion effects cannot be excluded – an Enron could have effects on the appraisal of the risk of financial assets in the neighboring country even in the absence of capital mobility -, one clearly anticipates correlations between risk-free bonds to increase with integration. One further expects that the return on the single risk free asset of a larger economic area will be less volatile than the risk-free rates of the constituent elements of this large entity under segmentation. This is because the large area risk-free rate should be less sensitive to idiosyncratic local market conditions than under segmentation. In other words, the specific local conditions should offset one another via the usual diversification mechanism. Finally, the same credit risk government bonds in the euro area now correspond to the same fundamentals. If the law of one price applies, they should be priced identically!

3.3 Quantity adjustments.

The pricing changes discussed in the previous section do not come about out from nowhere. They are the results of arbitrages taking place across an integrating economic area. These arbitrages act as signals for the changes at work. It is thus interesting to check for quantity adjustments and portfolio changes that are revealing of the transformation of the euro-area government bond markets into a single market for public debt. Of course,

not all, sometimes not even the major, changes in investors or borrowers behavior are necessarily due to the integration process. We retain the following relevant evidence.

The conversion of the outstanding government bonds and the denomination of all new issues in the new currency is a major contribution of the euro. It was widely viewed as likely to increase their collective appeal to investors and generate a substantial increase in volume. Galati and Tsatsaronis (2001) substantiate this prediction. By some measure, the size of the EMU area government bond market is now almost at par with the US treasury market.

In contrast with this statement, the 2001 ECB study on euro bond market reported that EMU sovereign outstanding bond issues represented 50% of the total outstanding bond issues (EUR 6,145 billions) in 2000, down from 54% at the start of Stage Three of EMU. This is the result of one factor non related to financial integrationm: the improvement in budgetary balances and lower or even negative net borrowing requirements over the period has led many EMU governments to carry out buy-back programmes or bond exchanges. Indeed, the overall budget deficit for the euro area decreased from 2.1% of GDP in 1998 to 1.2% of GDP in 1999, while the whole euro area registered a small surplus of 0.3% of GDP in 2000. As a result, issues by central governments have dropped from €600 billion in 1999 to €476 billion in 2000. Net bonds issuance by euro area central governments are displayed in Table 3.2, corroborating the decline in issuance activity between 1999 and 2000. It is worth mentioning that exceptional income from the sale of UMTS licences has contributed, at least partly, to the decline in sovereign issuance activity. On the corporate side, the funding of these UMTS licences together with the requirements induced by large mergers and acquisitions has led to an increased importance of the corporate bond sector.

With the disappearance of currency risk, the focus of investors has turned on the characteristics of bond issues rather than on the nationality of issuers. This has led euro area governments, now competing for the same pool of funding, to adopt new issuance strategies and techniques. Favero et al. (2000) also reports that sovereign issuers increasingly compete to obtain the services of primary dealers whose role is crucial in promoting national bonds abroad. This has forced them to provide concessions that increase the cost of debt-servicing. The consequences of these features are as expected from a unified financial area: government bond issues are increasingly held by non-residents. For example, in 2000, 33% of the bond issues by the French government were

held by non-residents, up from 16% in 1997, and the corresponding figures were 53% and 29% respectively, for Belgium (Galati and Tsatsaronis, 2001).

Table 3.2: Net bond issuance by euro area central governments

Country	**1999**	**2000**
Italy	67	28.7
Germany	48	34
France	35.3	22.7
Spain	23.6	19.4
Belgium	13.5	9.1
Netherlands	5.5	5.1
Austria	12.5	10.6
Portugal	6.8	3.3
Finland	-0.5	-1.6
Ireland	-0.3	-1.6
Luxembourg	0	0
Total	**211.4**	**129.7**

Source: The Euro Bond Market, ECB, July 2001

Finally, as expected, liquidity as measured by monthly volume in the secondary market has increased steadily in the major euro countries (France, Germany, and Netherlands). We will argue below that in the new context microstructure considerations take center stage. In this regard, the emergence of the so-called EuroMTS, an electronic platform to trade bond issues in excess of EUR 5 billions, is significant. It has triggered smaller issuers such as the Netherlands, Belgium and Portugal to opt for syndicated placements as opposed to traditional auctions. Banks in the syndicate have been successful so far in distributing the issues to a broader investor base in the Euro-area, although in some cases at a cost as dicussed above.

3.4 Evidence

Figure 3.1 traces the evolution of redemption yields from Datastream on euro-area government bond yields from January 1985 to August 2002. The benchmark government bond price index is also calculated using the same bonds. The downward trend observed in the later years is undoubtedly due to specific macroeconomic conditions. More remarkable in light of our discussion of section 3.2 and duly emphasized by observers is the evident convergence of government bond yields of the euro area. At the scale appropriate to represent the yields observed in the early 1990s, the plot is almost one of a single curve from 1999 on.

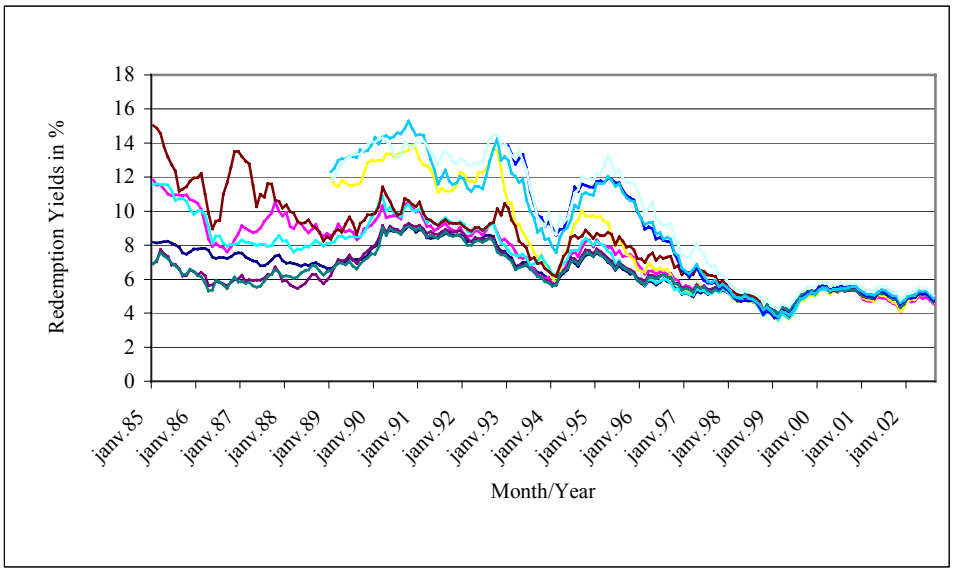
Is this convergence in levels confirmed by the evolution of correlations? To emphasize the time evolution and take due account of the short post-euro sample, we report in Figure 3.2

the time-series of cross-sectional dispersions of the government bond yields. The yield dispersion is calculated as the cross-sectional standard deviation of the redemption yields observed at a given point in time for the countries in the sample. It is intended to give a measure of the closeness of the yields. The lower the dispersion, the higher their correlation should be and conversely so when the dispersion is high. The change is striking as well. Dispersions have fallen by more than 90% from an average of 2.28 in the pre-euro period to an average of 0.16 since the euro. This indicates that from January 1999 onward the various government bond yields in the euro-area have exhibited a closely similar behavior as theoretically expected.

On cross sectional dispersions

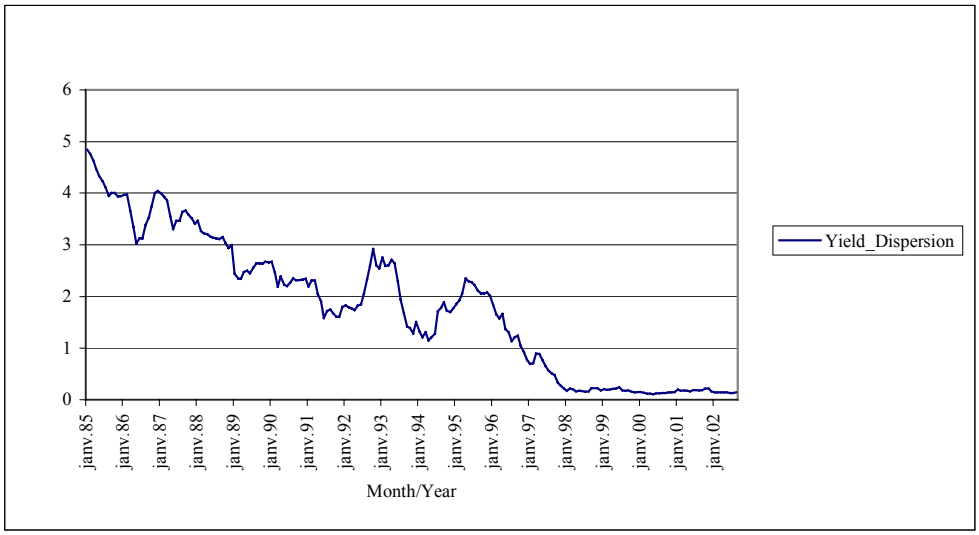
We will be using repeatedly the concept of dispersions to support the results obtained with simple correlations. Cross sectional dispersions are meant to be the cross-sectional counterpart to correlations and to provide the same underlying information. Our problem stems from the highly changing nature of the relationships we are focusing on and on the limited size of the post-euro sample of observations. If returns are highly correlated, then we expect that more often than not they will move together on the up side or on the down side. If they do, the instantaneous cross-sectional variance of these returns will be low. Conversely, lower correlations mean that returns often diverge, a fact translating into a high level of dispersion. Dispersions and correlations are thus inversely related. While correlations require a minimum sample length to be estimated with some precision, no such requirement is needed for dispersions, although the measure will be more imprecise if the number of returns entering in the variance measure is too small. Cross-sectional dispersions were first used in the context of equity returns by Solnik and Roulet (2000).

Figure 3.1: Convergence of EMU Gov. Bond Redemption Yields



Source: Datastream. The redemption yield used for each country represents the average yield on benchmark bonds within maturity sectors. That is, within each maturity sector, sample bonds are selected based on their tradability and interest to international investors and a weighted average redemption yield is computed on all selected bonds across the maturity spectrum.

Figure 3.2: Redemption Yield Dispersion of EMU Government Bonds



Source: Datastream - See Figure 3.1 for definition

A less well known result is displayed in Table 3.3: in conformity with theory, interest rates in Europe have become less volatile. The change in volatility is valid and statistically significant for each and every country in our sample, a striking result suggesting indeed that the euro-area bond markets respond to a smaller extent to idiosyncratic local circumstances and that inter-market arbitrages tend to distribute across the whole area, and thus stabilize, the effects of sudden local changes in supply and

demand conditions. The fact that our result holds as well for Germany and other traditionally low interest rate countries should dispel the suspicion that the smaller volatility in the post convergence period is a pure scale effect resulting mechanically from the lower general yied level.

Table 3.3: Volatility of Gov. Bond Redemption Yields

	Pre Euro	Post Euro	Var. Ratio Stat	P-values
AT	1.211	0.481	6.780	0
FR	1.797	0.474	2.994	0
FN	3.094	0.517	1.206	0
BG	1.809	0.535	3.759	0
NL	1.241	0.414	4.786	0
IR	2.224	0.456	1.807	0
BD	1.162	0.409	5.318	0
PT	2.842	0.507	1.366	0
ES	3.117	0.492	1.070	0
IT	2.944	0.433	0.929	0

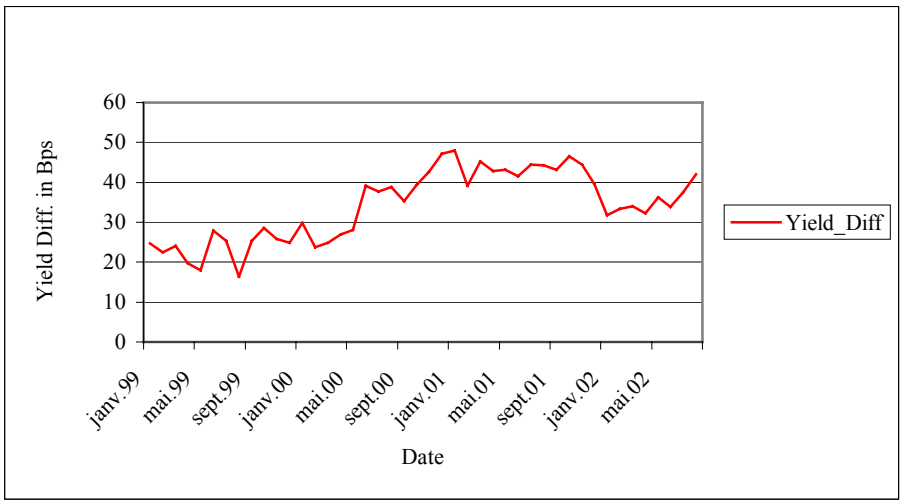
The pre euro period goes from January 1985 to December 1998, and
the post euro period from January 1999 to August 2002.

At first sight, this range of evidence provides spectacular support to the notion that the euro-area bond markets are highly integrated as concluded by Adam et al. (2002). Segmentation is apparently a thing of the past and from that perspective the disappearance of currency risk was indeed a major event!

Yet, if we step back to consider our distinction between the fundamentals and the pricing effects of integration, one is led to conclude that most of the responsibility for these observations resides in the convergence of fundamentals, which one can specifically traces to the EMU. They stem quasi-mechanically from the single currency. From this perspective, one may rather argue that the evolution has been disappointing and question whether there is further role to be played by financial integration *per se*. Indeed, the government bond markets of the euro-area still appear segmented in the sense that the pricing of the same, in some cases identical, credit risk government instruments has not fully converged. Pricing evidence indicates that the various public bonds have become very close substitutes as the convergence of the fundamentals easily rationalizes but full identification has not occurred. Indeed, Figure 3.3 illustrates the fact that, for some countries– here Italy –, spreads over German yields have increased since the start of the euro, an evolution which seems in flagrant contradiction with the convergence to a single price. To dispel the view that this might be related to credit risk, Figure 3.4 takes a closer look at the yields on French and Dutch government bonds. These instruments have the same AAA credit ratings. Variations in credit risk or in credit risk pricing can hardly

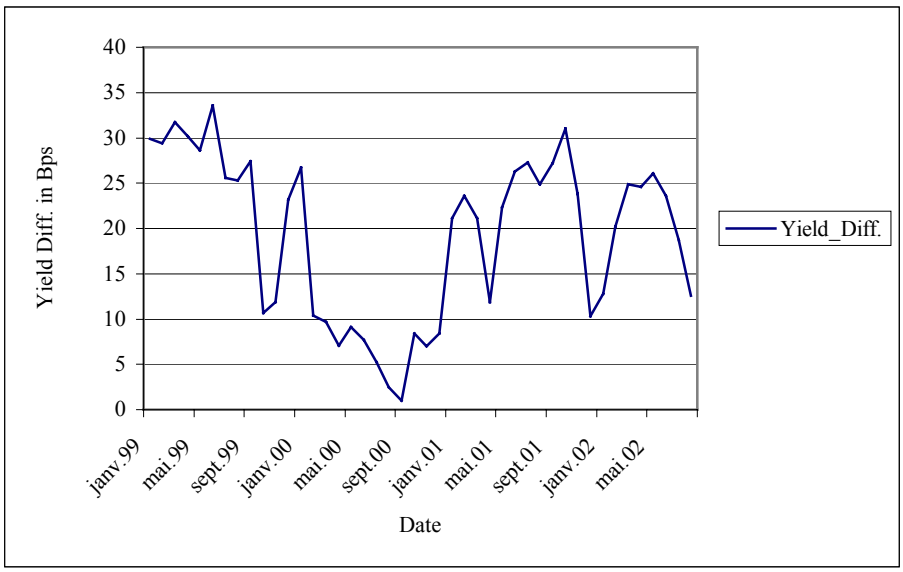
explain the diverging behavior of the yields on these two intrinsically identical instruments. The law of one price does not seem to apply! Yet other evidence is provided by looking at holding period returns on ten-year public bonds, which still exhibit a significant level of dispersion (Figure 3.5). The pre-euro rhetoric comparing the size of the euro- government bond markets with those of the US assumed that there would be one government bond market for the euro. This assumption is not warranted and it has to be considered as a failure of integration.

Figure 3.3: Post-1999 Yield Differential – Italy vs. Germany



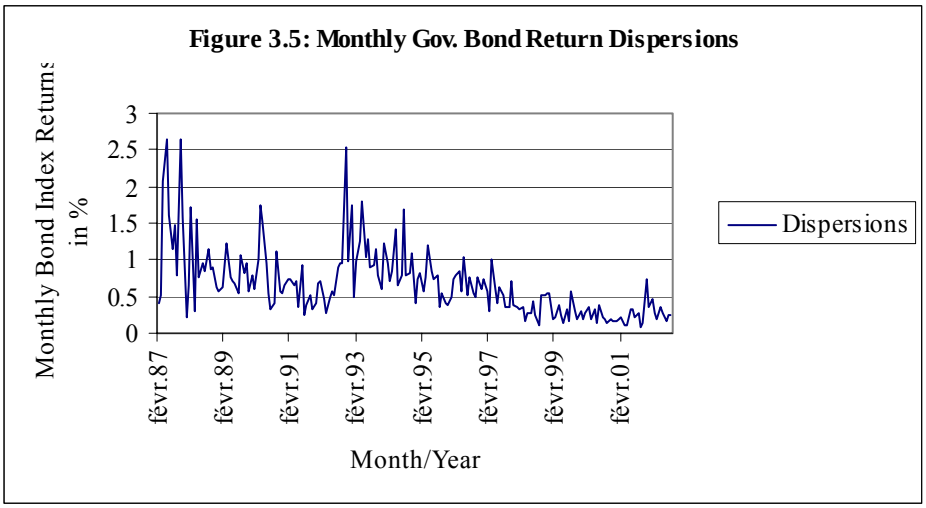
Data: Monthly redemption yields from Datastream - January 1999 to August 2002

Figure 3.4: Post-1999 Yield Differential – France vs. Netherlands



Data: Monthly redemption yields from Datastream - January 1999 to August 2002

Figure 3.5: Monthly Government Bond Return Dispersions



Data: Returns computed from monthly bond price indices using the same bonds as those selected for the redemption yields, see note for Figure 3.1 - January 1985 to August 2002

The missing piece in the puzzle is to be found at the levels of liquidity and micro-structure considerations, precisely the levels at which measures of financial integration should be kicking in and which in these markets now take center stage. On this score, Danthine et al. (2001) observe that the European government bond market seems to exhibit a behavior that may reflect the existence of multiple equilibria: since yields across different sovereigns are different, the markets for these issues are, by definition, segmented, which implies that the liquidity risk in the smaller segments is higher, which translates into differentiated yields, closing the vicious circle.

They also reflect that, at least conceptually, such a segmented market also has an equilibrium with full integration, that is, a constellation in which the participants' beliefs about integration are self-fulfilling. If market participants traded the different issues interchangeably on one single market, their liquidity would be identical (and higher), therefore their yields would be identical (and lower), and there would indeed only be one single market. In both cases, in the segmented equilibrium and in the integrated equilibrium, liquidity and its price (represented by the yield differentials) must be determined simultaneously, and this is the source of non uniqueness of equilibrium. Clearly, the equilibrium with a unified market is Pareto superior to the fragmented equilibrium because yields (and transaction costs) are lower in the former.

In view of this reasoning it is possible that the public bond markets of at least the Triple A issuers, Germany, France, the Netherlands, Austria, and Luxembourg, will in the future shift from one equilibrium to another to become one fully integrated single market. This

shift towards a good, high liquidity equilibrium is just a possibility, however. In theory, this could occur without further institutional change, simply as a result of changing market perceptions. Positive exogenous shocks on market fundamentals, such as transaction costs, demand, or exchange rates, also have the potential to move the EMU public bond market towards this high liquidity equilibrium. In this perspective, changes in issuing practices, such as concentration of issue sizes or coordination of issuing dates, may have effects far larger than the marginal effect of reduced transactions costs.

Investigating which additional measures of financial integration, if any, would be sufficient to promote the good equilibrium and whether the currently contemplated measures will succeed in doing so is an important question for research. At the current levels of public debt in EMU member countries (Table 3.4), the benefit of the elimination of the spurious yield spreads can be conservatively estimated at EUR 5 billion[2]! A simple way to get at the result would be to establish of a centralized agency in charge of issuing debt on behalf of the euro area's governments. Such a proposal was made in 1999 with a view of harmonizing the maturity structures, delivering a true and single benchmark curve and helping reduce the cost that some member states have to pay to primary dealers to promote their debt outside the country (Favero et al., 2000). It was met with considerable scepticism, because such a set-up implies some collective responsibility for national debts, which runs contrary to the Maastricht Treaty. The stakes are high, however, and, in the absence of a convincing strategy to achieve a truly unified public debt market via decentralized measures of integration, the debate on the establishment of a multilateral agency should be reopened.

Table 3.4: Domestic government debt markets, EUR billion, end of December 2000

	Short-term debt	Long-term debt	Total
Italy	102	885	987
Germany	10	599	609
France	43	573	616
Spain	45	225	270
Belgium	27	173	200
Netherlands	6	169	175
Austria	5	81	86
Finland	5	59	64
Portugal	0	46	46
Ireland	3	22	25
Luxembourg	0	1	1
Total	246	2,833	3,079

Source: ECB, The Euro Bond Market, July 2001

[2] Total outstanding debt of the Euro area minus Germany (2'470 billion) multiplied by 20 basis points = 4.94 billion.

4. Equity Returns and Risk Premia

4.1 Fundamentals

Our end-point is to assess the impact of financial integration on the pricing of equities and on equity risk premia. Our first step led us to focus on the effects of the euro on the risk free component of equity returns. We now turn to the equity premium. The first order of business is to check the extent to which the nature of the assets being priced has been affected. Indeed, financial integration is not proceeding in a vacuum and the impact of the euro is not limited to the elimination of currency risk. Currency unification is synonymous with full convergence of monetary policies and, in the euro area, with some degree of harmonization of fiscal policies as well. Even if the prediction of De Santis, Gerard and Hillion (1999) turns out right and the equity pricing mechanism is little affected by the euro, the resulting changes in the underlying fundamentals changes could nevertheless have a significant impact on equity markets.

It is often useful to think of equity prices or returns as being affected by a series of factors which one typically associates with the specific characteristics of the companies being priced, the industries to which they belong, their country of origin and a common global (or euro-area in the case at hand) factor. A truly global market factor may also be considered. This perspective is useful to reflect on the fundamental changes brought about by the euro and the single market for the valuation of European equities and it will be pursued further in later sections.

At the company level, one should note the undisputed growing trend toward multinational companies. This trend may be unrelated to EMU and the Single Market - although this is debatable - but it is in any case relevant for the identification of the factors determining equity returns. In the same vein, a trend toward multi-industry firms, i.e. conglomerates would also be relevant. At this level, fashion comes and goes, however, and after a much criticized tendency for managers to spread their wings across industries, the current mood appears rather to be focused and to encourage firm managers to stick to their trade. On the other hand, growing international trade, especially to the extent that it concerns intermediate goods, de facto renders the operation and performance of a company with a given location and affiliated with a given industry more dependent on economic events originating in other countries and other industrial sectors.

The euro and the single market do not seem to have a specific impact on the development of industrial sectors. The growing importance of services and above all the recent, extra-

ordinary evolution of the IT and Telecommunications sector are worth mentioning, however, as the latter in particular may introduce a distortion in the representation of the importance of the industry factor in determining equity prices and returns.

Much more is to be said of the macro environment precisely because the underlying context of financial integration, in particular the EMU and the single market, is likely to have a profound impact on economic structures and, of course, on macroeconomic policies.

The impact of economic development and regional integration on economic structures has been the object of a very rich literature. Most arguments support the view that the lowering of barriers to trade goods and financial assets tend to promote more specialization of national industrial structures. The first such arguments are those building on Ricardian trade theory: decreases in impediments to international trade make it possible for countries to stick to their comparative advantages. The new economic geography has emphasized the existence of pecuniary externalities associated with agglomeration as a source of geographical specialization. Monopolistic competitors tend to cluster to take advantage of these externalities, a theory for which Krugman (1991) finds support in the comparison of employment patterns in the US (which is more specialized) and in Europe (which is less). A strategic objective toward diversification – so as to produce a more stable economic structure - and a taste for diversity may be counteracting forces. While the latter may suggest that a higher level of economic development could be associated with less specialization, ceteris paribus, they also imply that economic integration, to the extent that it means the lowering of trading costs, on the one hand, and financial integration providing other means for diversification, on the other, should be associated with more specialization at constant levels of development.

Let us review the import of the diversification argument for financial integration, returning for that purpose to our polarized world. Under full financial segmentation, local investors have no choice but to finance local firms and, conversely, firms depend on local investors for their financing. Limited diversification possibilities for investors mean that they will require a high compensation for holding participations in risky, undiversified firms. The cost of capital of the latter will be high. This implies that firms have an incentive to diversify on their own if they can, especially if they can do it by expanding abroad, for example through the build-up of conglomerates or association with multinationals. This is the case even if from a larger perspective these attempts at diversifying at the firm level are inefficient. Similarly, within a country, one may observe

the existence of productive activities which may be relatively inefficient or for which the country may not have a comparative advantage simply because they increase the local diversification possibilities and as a result benefit from a lower cost of capital.

By contrast in an integrated financial market, there is no financial premium to industrial sectoral or geographical diversification and better specialization is affordable. Financial integration thus has the potential of changing the mix of investment projects being financed and to open the way to a higher degree of industry specialization across countries.

Imbs and Wacziarg (2002, forthcoming) show empirically that industrial concentration follows a U-shaped pattern as a function of the level of economic development: after an initial development phase where agriculture takes the lion's share of resources, countries start to diversify, with labor being spread more equally across various industrial sectors. But at a later stage of development they begin to specialize again. The turning point occurs relatively late in the development process and is estimated at per capita GDP of approximately $10'000. They interpret their findings as resulting from the interplay of productivity increases and decreasing transport costs. The latter clearly constitute a force of concentration. In a Ricardian model, an increase in a country's productivity relative to the rest of the world translates into an increasing range of goods being produced domestically. The observed stages of diversification then depend on which force dominates at any given point in a country's growth path.

These effects on industry structures may well be offset by the convergence of macroeconomic policies that is a hallmark of EMU. With a single monetary policy, closely aligned interest rates, and fiscal policies subject to a common discipline, the macroeconomic influences on company profits and euro-wide discount factors are clearly converging. Policies and structures are thus expected to exert conflicting influences on the fundamentals of equities. Now, structural changes are expected to be slow. Moreover, there may be a ratchet effect of earlier decisions of localization and diversification. With fixed costs, slowly changing incentives may not lead to a reversal of previous decisions. By contrast, the effects of the coordination of macroeconomic policies are more immediate and the changes provoked by the euro are in some cases dramatic. The convergence of yields of public bonds discussed earlier is a case in point. All in all one could thus rationalize that euro-area business cycles are becoming more as well as less synchronized. But our prior is that the effects of policy will dominate and that the (orthogonal) country factors in equity returns will lose some of their importance.

Note that somewhat ironically if common policies make country specificities within the euro-area less prominent, they also decrease the diversification benefits brought about by financial integration. In other words, as financial integration makes diversification within the euro-area increasingly easy, economic integration makes diversification inside the euro-area increasingly less relevant. In that sense, there is some redundancy in economic and financial integration! We now turn to a discussion of the expected impact of financial integration on the pricing of equity securities.

4.2 Pricing

4.2.1 A unified risk premium?

The risk premium on a given asset is typically defined as the product of the market price of risk and an appropriate measure of the riskiness of the asset. The celebrated CAPM holds that the latter is a function of a single factor, the return on the market portfolio. An asset is therefore considered as risky to the extent that it contributes to the risk of the overall market portfolio. This view of the world has implications for the impact of financial integration on the pricing of equities. We start by deriving them. In the next sub-section, we will generalize this perspective and consider the possibility that more than one factor impacts on the riskiness of an asset.

In the case of full segmentation, local investors hold undiversified portfolios (from the viewpoint of the global economy). Their reference market portfolio is limited to national firms. The appropriate measure of risk for the local country portfolio then is its standard deviation. Everything else being the same, one expects that the risk premium will be high as a result of investors holding (internationally) undiversified positions.

In a single financial market, investors hold internationally diversified portfolios. The proper measure of risk for the local country portfolio is not its standard deviation but its beta with the world portfolio. There is thus less undiversifiable risk to be remunerated. There is thus a presumption that the risk premium should be lower.

To make this concrete, let us follow Stulz (1999) and assume a simple situation where all individuals display constant relative risk aversion. The price per unit of risk is constant and identical in initially segmented markets or in the whole integrated area. Let us denote it by P. The reasoning above effectively states that under segmentation the risk premium on a given security i will be $\sigma_i^2 P$, where σ_i^2 is the variance and σ_i is the standard

deviation of the returns on asset i. The same asset in an integrated market will yield a risk premium of $\beta_i P = \rho_i \sigma_i \sigma_m P$ where β_i is the beta of asset i, a function of its covariance with the market portfolio which can also be written in terms of the correlation coefficient between the market portfolio and the return on asset i, ρ_i. From this little exercise one obtains that if the following condition is satisfied

$$\frac{\sigma_i}{\sigma_m} > \rho_i$$

and thus in particular if $\sigma_i > \sigma_m$, then the risk premium in an integrated market will necessarily be smaller than in segmented markets. We will check the validity of this condition for the euro-area in section 4.4.1 below.

More generally, degrees of risk aversion may vary from one country to the next (e.g. a popular assumption of habit formation implies that the rate of risk aversion fluctuates with the growth rate of consumption), as well as from one period to the following, and as a result, under market segmentation, the price of risk may vary across countries. It will be a function of the local capital markets conditions: relative abundance of savings, relative risk appetite. With integration, the price of risk converges. It is not impossible that the single post-integration risk premium is in fact higher for some markets. This is the case if, before integration, a given country was characterized by a relative abundance of savings, a stronger than average tolerance to risk and/or a scarcity of risky investments to be financed. This cannot hold on average, however. For most market participants one expects that the risk premium will be lower and more stable after integration.

4.2.2 A multi-factor decomposition

We now extend this discussion by using a multi-factor approach to the equity risk premium. As anticipated in section 4.1, we consider the possibility that equity returns are impacted by several (orthogonally defined) factors: sectors, countries, global (euro area/world). This follows a tradition initiated by Heston and Rouwenhorst (1994). Following their contribution, a very large literature has estimated the relative importance of these various factors. For our purpose, the key result has been the almost unanimously conclusion that, until very recently at least, country factors dominated industry factors. That is, the fraction of the variance of equity returns (or excess returns) that can be explained by the variance of the country factors exceeds the portion of the variance explained by the variance of the industry factors.

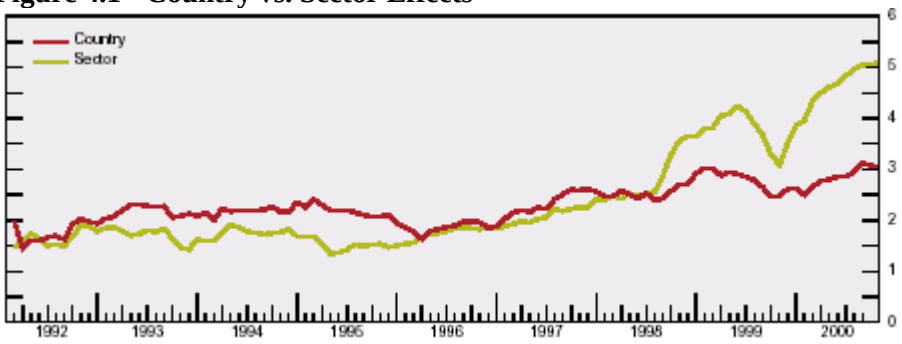
Rouwenhorst (1999) provides a useful update. He focuses on European stocks with MSCI data containing the returns of all 952 stocks in the MSCI indexes of 12 European countries

and a data set ending in August 1998. With an eye on the potential impact of economic and monetary integration on the results of the variance decomposition, he concludes that the superiority of country effects has been effective at least since 1982 and that it has continued during the 1993-98 period "despite the convergence of interest rates and the harmonization of fiscal and monetary policies following the Maastricht Treaty".

A couple of recent studies dispute the validity of this conclusion for the most recent sample period, however. Thus, while Isakov and Sonney (2002) confirm the dominance of the country effects for the period 1997-2000, they also detect a shift in the last part of their sample. Allowing for time variations in the decomposition, they find that industry factors are growing in importance. Their data tend to suggest that over the 36 weeks preceding the end of the year 2000, industry factors explain a larger fraction of the variance of returns.

Galati and Tsatsaronis (2001) come up with even more definitive conclusions. Using the same methodology they look at the companies in the FTSE Eurotop300 but complete their assessment with a time series analysis of the weighted factor averages. Their results are summarized in Figure 4.1 from which one infers that industry factors have become more important than country factors for the first time a few months prior to the formal arrival of the euro. Contrary to Rouwenhorst (1999) and even Isakov and Sonney (2002), they also find that the superiority of the country factors was insignificant since the beginning of 1996 and even as early as 1992. This points to a difficulty with this literature. The results obtained with the Heston-Rouwenhorst approach appear to be very sensitive to the data used, the definition of sectors, and the period of analysis. Table 3 in Isakov and Sonney (2002), for example, shows that the ratio of the fraction of return variances explained by country and industries varies in a ratio of 2 to 11.5! And the results in Rouwenhorst (1999) are clearly incompatible with those of Galati and Tatsaronis displayed in Figure 4.1. This observation will lead us to complement the view proposed by this literature with a simple and robust approach focusing on the correlations of the returns on country and sector portfolios or indices. We anticipate our demonstration that there must be a one-to-one relationship, under the Heston-Rouwenhorst maintained hypotheses, between the results of the variance decomposition and these correlations and now turn to a discussion of the impact of financial integration on the pricing of such portfolios or indices.

Figure 4.1 - Country vs. Sector Effects



Source: Galati and Tsatsaronis 2001

As mentioned before, financial integration implies the convergence toward a single pricing kernel or discount factor. This pricing convergence affects both country and sector portfolios. Full segmentation would mean that a basket of French stocks is priced by French investors in a way that is largely disconnected with the way a basket of German stocks is priced by German investors. It also means that the German stocks in a particular industry basket would be priced via a pricing kernel that could differ and evolve differently through time from the pricing mechanism of the French stocks belonging to the same industry. Note than in the case of full segmentation the very concept of a euro-wide sectoral index is not operational since it does not correspond to a portfolio available to the representative investor.

The convergence of risk-free rates and of risk premia expected under financial integration implies that, ceteris paribus, both country and sectoral basket of stocks will have a tendency to be priced closer together. But of course, our discussion in the previous two sections indicates that the ceteris paribus does not apply. If the pricing component of equity returns converges, the objects being priced also change, potentially introducing increasing divergence in returns. Thus, in particular, if a country industrial structure becomes more specialized, the fundamentals of country indices are getting more dissimilar and returns on country indices are subject to two conflicting influences that could entail more synchronized as well as less synchronized returns. If on the contrary national economic structures are getting more alike or/and if the influence of increasingly common policies are the dominating factor, then indeed, both components of the pricing of country indices would display a tendency toward increasing correlation.

As far as sector returns are concerned, the pricing effect of financial integration should in principle dominate: financial integration should translate into portfolio of stocks representing an industry across the geographical area being priced closer together. But

short samples are a specific problem here: a specific history of sectoral shocks, leading for instance to a temporarily diverging performance (viz. the IT sector in recent times) may pollute our appreciation of the correlation between industry indices. Over the medium run, it is difficult to make a link between increasing financial integration and diverging sectoral returns. Note that the short sample problem also plagues the appreciation of the correlation between country returns if countries do not correspond to well diversified portfolios of sectors. Isakov and Sonney (2002) suggest this is not the case, however. We now turn to a discussion of quantity adjustments in search for evidence that financial integration is leading to behavioral changes on the part of investors or borrowers.

4.3 Arbitrages - Portfolio flows (Quantities)

The object of this section is to document changes in portfolio allocation and portfolio flows that would be indicative of the significance of financial integration for private and institutional investors. Financial integration implies arbitrage opportunities, indeed, is brought about by the exploitation of such arbitrage opportunities. This in turn signifies some adjustments in quantities, either from euro-area investors or from investors outside the area. Accordingly we would like to document the extent to which there is something changed in the investment strategies of European and non-European investors relative to equity positions in the euro area. We need to repeat our earlier word of caution, however. Market circumstances since the advent of the euro have been spectacular, on the upside until about mid-2000, on the downside ever since. One would not be surprised if, over the period under review, actual portfolio positions held by private and institutional investors, and changes in them, had been dominated by these circumstances, making it extremely difficult for observers to detect the impact of the structural changes. And indeed the evidence reported in the first sub-section below is relatively inconclusive. For this reason, we also focus, in the second sub-section, on the investment process as opposed to the results of this process (portfolio holdings) only. This is warranted because of strong evidence that the euro has been a catalyst for a significant process change likely to produce, in turn, changes in results measurable over an average investment cycle. At the level of quantities, we believe this process transformation is by far the most significant identifiable change affecting equity investments and our task will be to understand its impact and rationale.

4.3.1 General description of portfolio flows

In this sub-section, we document the most relevant developments in equity portfolio flows and holdings. We start with two observations for which the responsibility of the euro is

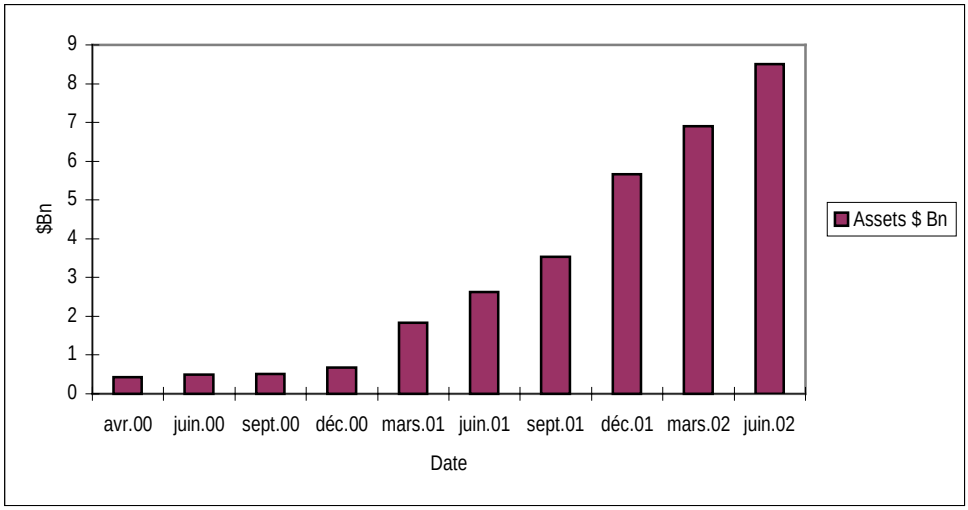
much in doubt: the equitization of the euro area and the growth of passive investing. It appears that the euro area has developed, over the recent years, a more pronounced appetite for equity investing. The likely culprit is the buoyant stock prices of the 1999-2000 period resulting in increased equity issuance - international equity issues by euro area companies have doubled compared to the previous two years to reach a record high of $119 billion. Note, that, while impressive, this growth rate is, on balance, slightly behind the 119% rate observed for the block of developed countries during that period. Also relevant for this phenomenon is the fact that the advent of the euro coincided with the creation of new equity markets: Neur market in Frankfurt, Euro NM in Belgium, Nuevo Mercado in Milano, Nouveau Marché in France, etc.

The popularity of equity investing is also manifest through the proliferation of Exchange Traded Funds (ETFs), particularly equity sector funds. ETFs are registered investment vehicles that are designed to replicate an index. They are quoted like stocks in contrast to traditional equity funds, they are thus more transparent. And they have the lowest expenses of any registered investment product. The assets under management of European ETFs have gone from nearly non-existent in early 2000 to approximately USD 9 billion in June 2002 (Figure 4.2). Europe by now has the largest number of ETF sponsors (12) offering 92 ETFs with 154 listings, and a good proportion of the funds represent sector and industry portfolios. Again, these numbers are impressive, but when compared to their US and Japanese equivalents, the picture is somehow less clear cut. Indeed, out of the 120.6 USD billion assets under management by ETFs in June 2002, 90.1 billion were managed by US ETFs while Japanese ETFs managed 14.1 billion. In the first quarter of 2002 alone, assets under management of ETFs increased by USD 15.9 billion, of which 7.7 billion were accounted for by Japanese ETFs and 5.5 billion from US ETFs. On this front, the evolution in Japan is thus even more spectacular than what we see in Europe.

Portfolio flows may be quasi automatically generated by the growing importance of passive investment strategies linked to new equity and fixed-income benchmarks. Indeed, the creation of the single area has been accompanied by the birth of new indices that are area-based (for example, MSCI EMU, EuroStoxx, FTSE Euro100, etc…) or global industry/sector based (ie, EuroStoxx Banks, EuroStoxx Energy). These indices are widely used in portfolio indexation or as underlying for exchange traded funds (ETFs). The new country weights in the new benchmarks call for portfolio re-balancing. In late 1999, Morgan Stanley's Research projected that the flows shown in Table 4.1 would occur amongst EMU countries following the re-balancing of Pension Funds' equity portfolios. The figures are in billions of USD and are calculated assuming that each pension fund will

invest in the participating countries proportionally to their equity market capitalization. While this assumption may be somewhat strong, it is nevertheless consistent with a passive replication of an EMU area index. On this basis, the winning countries in terms of inflows are the big market capitalization countries such as Germany (+21.6 billion), France (+10.3 billion) and Italy (+10.9 billion). Because Dutch pension funds invested heavily in their home equity market (which is tiny compared to other EMU countries) prior to the euro, the Netherlands would experience the largest equity portfolio outflows (-47.1 billion). Ex post, the ECB (2001a) announces negative outflows for Ireland and Belgium because the flows benefited mainly to large capitalization firms, which are not present in either countries.

Figure 4.2: European ETFs – Assets in $ Billion



Date	Apr-00	Jun-00	Sep-00	Dec-00	Mar-01	Jun-01	Sep-01	Dec-01	Mar-02	Jun-02
Number of ETFs	3	3	3	6	16	33	43	71	92	92

Source: Morgan Stanley: Exchange Traded Funds: A Global Overview, July 16, 2002

The impact of the effective lifting of currency matching rule restricting institutional investors is one of the most interesting effect of the euro to be documented. Again we have to warn that market conditions since the inception of the euro may be a determining factors of what is observed. Figure 4.3, taken from Adam et al. (2002) shows that the share of foreign equity held by euro-area pension funds was roughly constant in the majority of the countries before 1998 (this is consistent with Detken and Hartmann, 2000), but the share seems to be on an upward trend since 1998. Danthine et al. (2001) present specific evidence concerning the asset allocation and international diversification of German investment funds covering the 1990-1998 period. Their results, shown in Table

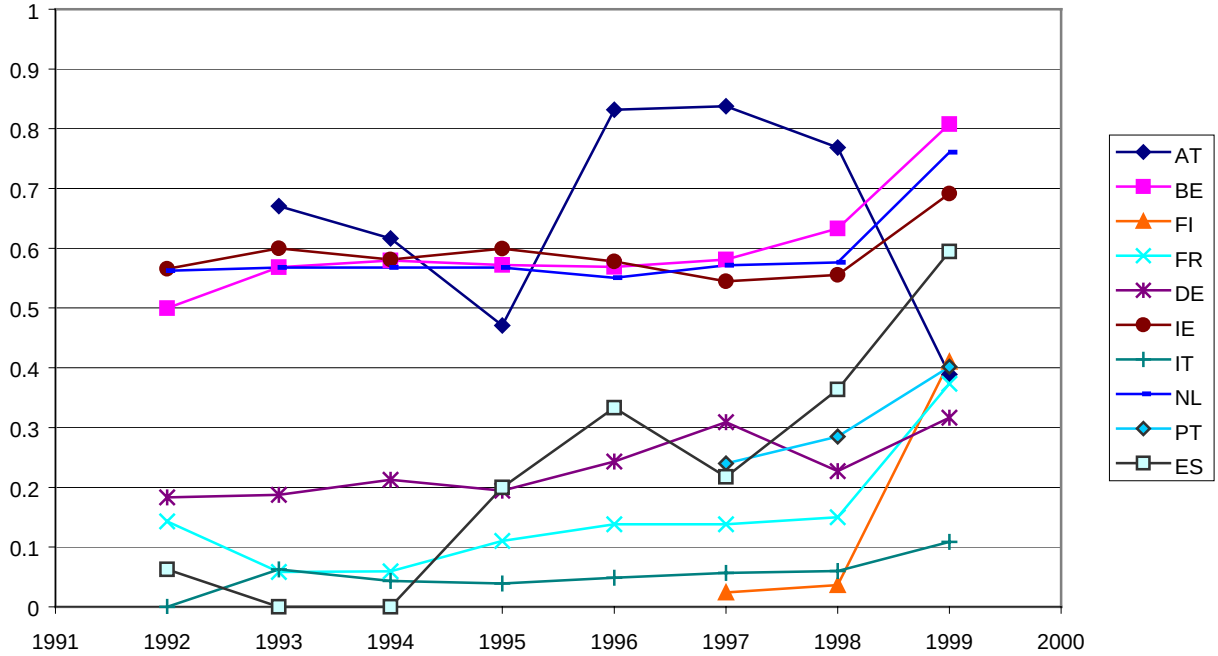
4.2 first indicate that the proportion of equities in the model portfolio has increased relative to fixed-income assets (from 20.2% in 1990 to 41.9% in 1998). Secondly, the share of domestic equity went from nearly 81% in 1990 to 48.7% in 1998. This latter evidence is clearly suggestive that this class of German investors are buying more and more euro area and non-euro area equities. This accords with results in Adam et al. (2002). Hardouvelis et al. (2001) provide similar evidence on the equitization of euro area pension funds and life insurance companies.

Table 4.1 Possible Pension Fund Equity Market Flows as a Result of EMU, in USD billion

	Before EMU	After EMU	Net Gain from EMU
Austria	0.6	1.5	0.9
Belgium	5.4	5.6	0.1
Finland	3.6	3.5	0
France	21.6	31.9	10.3
Germany	16.8	38.4	21.6
Ireland	8.3	1.8	-6.5
Italy	6.3	17.2	10.9
Netherlands	68	21	-47.1
Portugal	1.1	2.5	1.4
Spain	3.1	11.6	8.6
Total	**134.9**	**134.9**	**0**

Source: InterSec 1998 Reports and MSDW estimates

Figure 4.3: Pension Funds: Foreign Equities as a Percentage of Total Equities Invested: Euro Area Countries (1992-1999)



Source: Adam et al. (2002)

Table 4.2: Asset Allocation and international diversification of German Investment funds 1990-1998

Year	1990	1991	1992	1993	1994	1995	1996	1997	1998
Total assets under management (DM billion)	220	262	279	370	399	462	572	785	1004
Equity (%)	20.2	20.7	21.9	27.7	27.8	27.0	30.3	37.9	41.9
of which domestic equity	80.8	77.7	77.1	73.8	71.3	72.7	68.9	63.2	48.7
Bonds (%)	67.0	69.3	68.6	63.6	63.5	64.5	61.8	54.4	50.3
of which domestic bonds	52.9	57.8	64.2	67.2	70.4	75.5	76.7	73.8	73.4
Other (%)	12.8	10.0	9.5	8.7	8.7	8.5	7.9	7.7	7.8

Source: Danthine et al. 2001 - Bundesbank (1999)

Ironically, the emergence of the single currency has also brought about portfolio concentration issues and the requirement to maintain a minimum number of investment currencies into the portfolio may lead euro area and non-euro area investors to seek diversification opportunities outside the EMU area. Evidence along this line is found in Table 4.3 which displays aggregate data on portfolio flows. The table is constructed by summing monthly flow balances by asset class in each year. Total flows into the euro area equities appear to have been negative from 1998 to 2000 while they were positive in 2001.

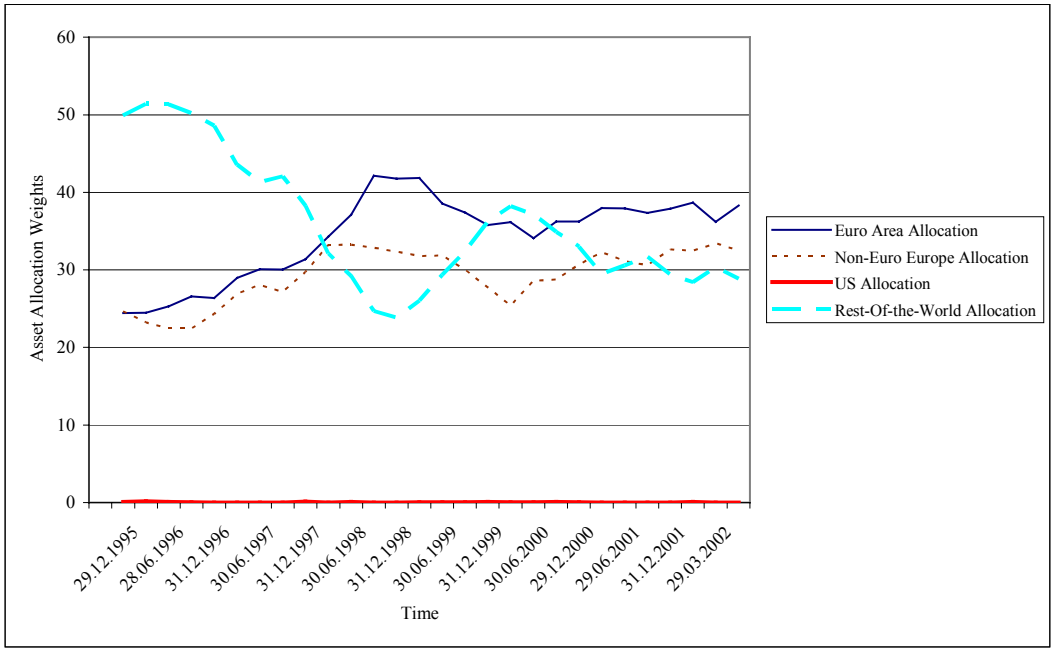
Of course net flows also depend on the positions taken by investors from outside the euro area. We report illustrative evidence on this score for a sample of American and Swiss institutional investors. Non-euro area investors are as likely to attempt to exploit the new arbitrage opportunities arising in the euro area as are the local residents. Figure 4.4 looks at the average allocations for US pension fund assets invested in developed markets outside the US as of the end of 2001. The sample represents $ 365 billions of assets covering 120 portfolio strategies and accounting for 95% of all assets invested by US pension funds in EAFE accounts (developed world ex-US). It appears that the share of euro area equities has been increasing, from 24% in 1995 to about 38% in 2002. This is also true for non-euro Europe, although the share there is smaller. The increased interest in European equities from the US perspective has occurred at the expense of the rest of the world.

Table 4.3 : Portfolio Investment in euro area, balance in EUR Billion (ECU in 1998)

	1998	1999	2000	2001	2002-June
Equity	-12.2	-63.9	-243.3	144.3	10.7
Bonds & Notes	-117.5	-36.9	126.6	-77.7	9.8
Money Mkt Instruments	19.7	55.2	5.1	-30.3	-17.5
Total Balance	**-110**	**-45.6**	**-111.6**	**36.3**	**3**

Source:ECB data, via Morgan Stanley, London.

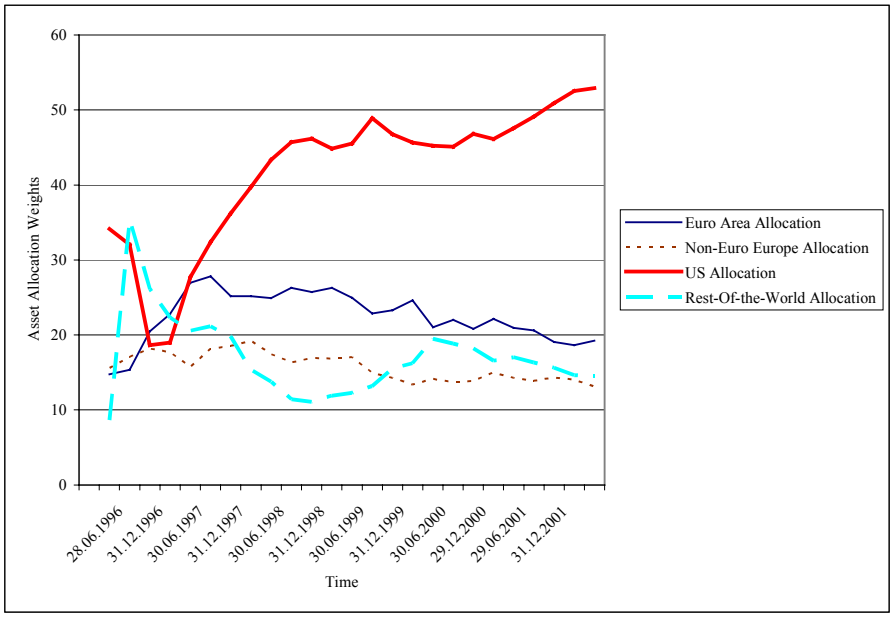
Figure 4.4: US$: USA Non-US Equities



Source: InterSec Research Corp.

In Figure 4.5, the same InterSec data source is used for 25 Swiss pension fund portfolios representing USD 1.7 billion at the end of March 2002. The data is expressed as percentages allocated to different regions. From a Swiss perspective and in contrast to the evidence that emerges from the US pension funds, the share represented by euro area equities seems to have declined, from almost 28% in June 1997 to 19% in March 2002. At the same time, the share of US equities in the Swiss portfolio has steadily risen, from 32% in 1997 to 53% in March 2002 while the non-euro Europe has a stable share.

Figure 4.5: CHF: Swiss Global Equities



Source: InterSec Research Corp.

4.3.2 The shift in asset allocation paradigm

We now concentrate on the process by which portfolio positions are determined rather than on the results of the process (portfolio holdings or flows). Indeed, most observers would argue that the major change in the European equity scene is the shift in the asset allocation paradigm. A sizable fraction of analysts have in fact equated the euro with this change without even questioning the hypothesis that it is the direct result of financial integration. In this section we attempt at squaring this important stylized fact with our theoretical discussion.

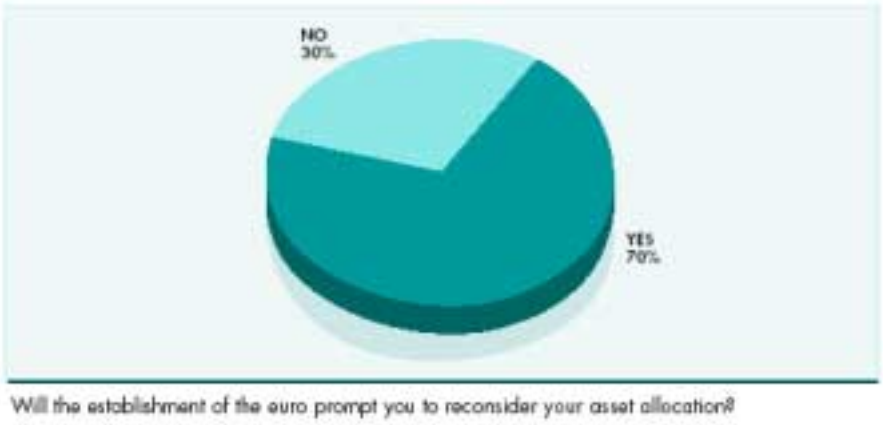
It is a common practice among portfolio managers to follow a top-down approach to asset selection. Traditionally the first step of the top-down approach consisted in deciding on a country allocation grid, effectively placing first priority on an adequate geographical diversification of portfolios. The second step consisted in selecting the best securities in accord with this allocation, that is, within each national market to the extent permitted by the grid. This practice can be placed in the context of the discussion on the relative importance of country vs. industry or sector factors in explaining the cross-section of international returns. The standard position arguing that country factors were dominant supported the geographical slant of the top-down approach. Everywhere, the argument is now made that the country orientation of the top-down approach should give way, within the euro-area at least, to an industry or sector orientation. According to this view, the first step of the portfolio optimization should be undertaken at the industry level.

The results of a survey undertaken by Goldman Sachs and reported by Brookes (1999) showed strong evidence that the euro would indeed lead them to reconsider their asset allocation process – see Figure 4.6 – and that post-euro they would base their decisions on sectors rather than countries. In the same vein, a member of the industry, Clariden bank (a Credit Suisse group company) recently explained its newly adopted approach as follows: "In recent decades the world economy has behaved in an increasingly integrated fashion. In this environment, many large companies now operate on a global basis. Increasingly, one can speak of global industries. The implication, which is statistically supported, is that strategic or "top down" equity decisions are more efficiently made within a global industrial sector framework than by using a regional or country approach. Recognizing this shift, Clariden Bank uses a global sector approach to equity strategy. We have established a comprehensive range of global equity sector funds. These are our core building blocks for strategy implementation." (Clariden Bank, 2002). And one of the large players in the asset management industry, Capital International – $ 600 billion under management – which has consistently adopted the practice of using a bottom-up approach, that is, of focusing on the (non-quantitative) analysis of individual firms and their stocks could state "We have not been affected by EMU", meaning by that, "Contrary to our competitors, we have not had to reorganize our analysts' department" (Personal communication)!

Now as the Clariden statement illustrates, the trend is global and goes beyond the euro-area. The change in asset allocation paradigm appears, however, to have coincided with the advent of the euro and in many ways to have been provoked by it. And superficially at least, it could be explained by the weakening of the superiority of country factors over industry factors, a reversal that could have resulted from the shift in macroeconomic fundamentals discussed in section 4.1 and that we will confirm in section 4.4.2. But as we have already mentioned the evidence presented in support of the supposed dominance of industry factors is neither unambiguous, nor overwhelming. And the change in paradigm is not in line with the documented prediction by De Santis et al. (1999) and others that the euro would only have a very limited impact on equity markets. Indeed, the change in asset allocation strategy is not a minor change. It is viewed as implying that the teams of analysts, until now organized along country line, are to be reorganized along industry lines. This in turn is meant to imply that the sought after competencies will be the ability to analyze the prospects of an industry and of specific firms within that industry as opposed to the prospects of a country, in particular its macroeconomic outlook. For all

these reasons, we think the paradigm change constitutes a genuine puzzle deserving further scrutiny. This will be the object of section 4.4.3.

Figure 4.6: The Goldman Sachs/Watson Wyatt Survey



Source: M. Brookes (1999)

4.4 Evidence

4.4.1 A lower risk premium

In section 4.2.1, we derived a necessary condition for the equity risk premium under integration to be lower than the equity risk premium under full market segmentation. It was observed that if the variance of the national equity indices was higher than the variance of the market portfolio then, under stylized conditions, financial integration would necessarily result in a lower premium. Figure 4.7 below plots the 12-month trailing standard deviation of the German equity index (MSCI indices) against the standard deviation of the MSCI EMU index. Similar results are found in the appendix for the other

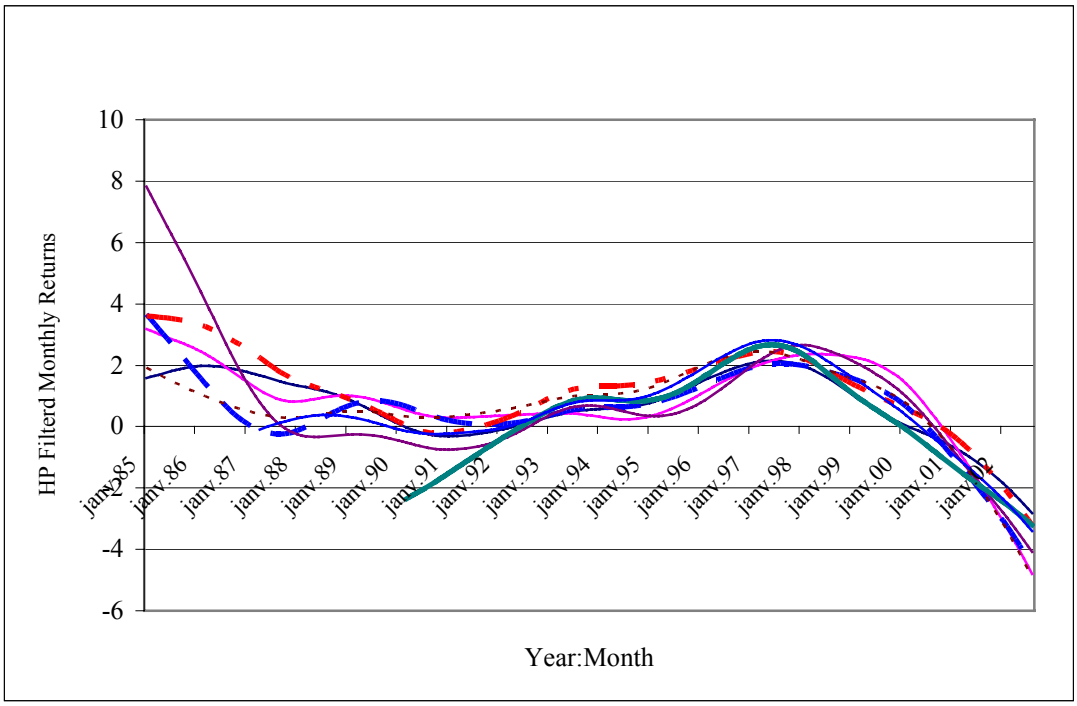
euro-area countries. These results are unambiguous. The EMU-wide systematic risk as measured by the standard deviation of the MSCI EMU index is always smaller than the corresponding measure for the national markets. The latter would be relevant in the case of full segmentation. Thus, at this first level of observation, the message is clear: an important condition for financial integration to result in a decreasing equity premium is satisfied.

Figure 4.7: 12 Month Trailing Standard Deviation

Data and methodology: Monthly MSCI price index series (inclusive of dividends) for each of the countries and the EMU area - December 1987 to July 2001. The first 12 monthly returns are used to compute the first standard deviation, and the window is moved each time by dropping one observation and adding a new one to obtain a time series of 152 standard deviations.

In an attempt to illustrate convergence –if any- of EMU equity returns, in the same vein as we did for government bond yields, we display in Figure 4.8 the Hodrick-Prescot filtered equity returns for the EMU countries. There is a clear, quite remarkable, movement of convergence up to about 1992 but not much is happening thereafter. In particular the impressive convergence in risk free rates of the end of the 1990s does not leave a trace on total equity returns. This result is somewhat surprising and it warrants further investigation. The primary suspect is the simple fact that equity premia are simply larger and more volatile than the returns on government bonds (Table 3.1) and that, for that reason, changes in the first mask all evidence of changes in the latter.

Figure 4.8: EMU Countries HP-Filtered Equity Returns



Source: Own calculations - Return data from Datastream

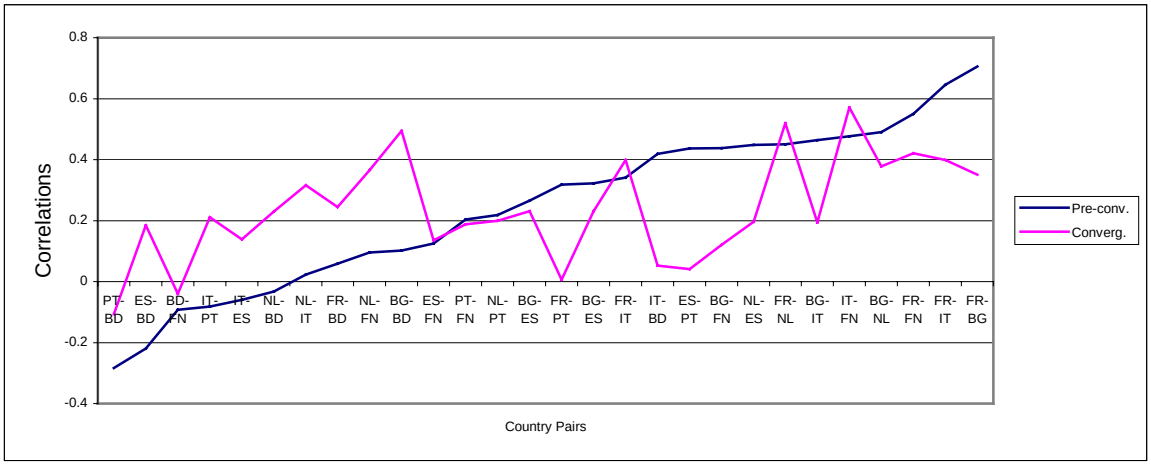
4.4.2 Synchronized business cycles

This sub-section looks at the macroeconomic evidence underlying the importance of the country factors on equity returns. We have argued that European integration could stimulate more specialization in national industrial structures, but that, in contrast, the convergence of macroeconomic policies was naturally going in the direction of a higher synchronization of business cycles.

Figure 4.9 reports the pairwise correlations of GDP growth rates across the euro-area while Figure 4.10 displays the time-series of the cross-sectional dispersion of the same GDP growth rates. GDP figures are collected from Datastream on a quarterly basis for each of the EMU member countries, from the first quarter of 1986 to the first quarter of 2002. In Figure 4.9 we split our sample in two equal sub-periods and compare the pairwise correlations in the first vs. those obtained in the second. Figure 4.9 does not reveal a clear aggregate pattern of increasing or decreasing correlations. If anything, those country pairs for which correlations were low during the first part of the sample turned out to be higher in the second part and conversely. Exceptions are Germany and Finland with a low correlation remaining low and the pairs France-Italy, France-Netherlands, and more surprisingly Italy-Finland with high correlations getting even higher.

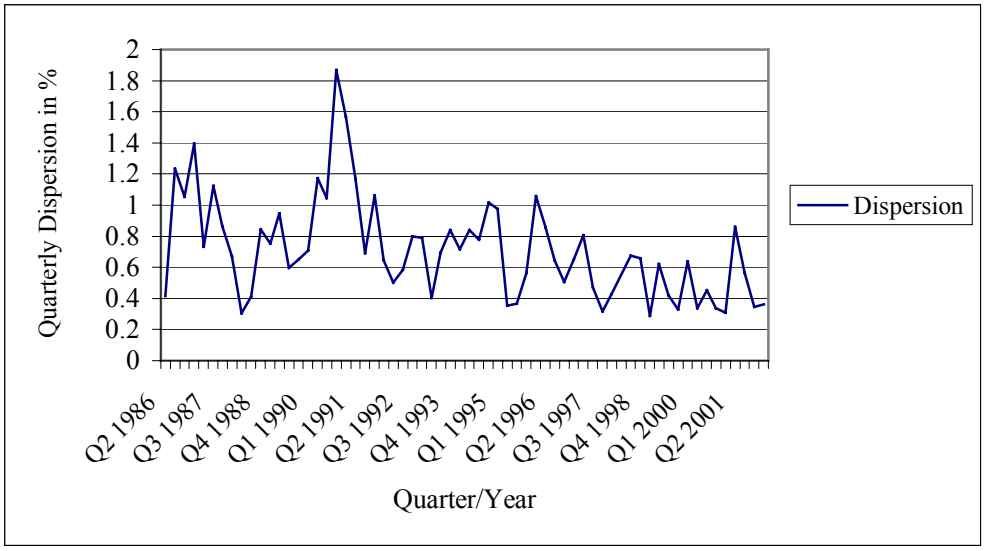
This instability in pairwise correlations has its counterpart in the sizable volatility of the dispersions displayed in Figure 4.10. Here, however, a clear trend is identifiable. In fact, the average level of dispersion was 0.86 for the period from 1986 to 1994 and 0.58 only for the period from 1995 to 2002. There thus appears to be a significant evolution towards more synchronization in the business cycles (broadly defined in terms of raw data, as appropriate given the focus of our inquiry) of the euro-area countries.

Figure 4.9: Evolution of Country Pair Correlations (GDP Growth Rate): Before and During Convergence



Source: GDP data from Datastream

Figure 4.10: Quarterly GDP Growth Rate Dispersions



Source: GDP data from Datastream

Our results are in line with those obtained elsewhere in the literature with a variety of methodologies. See, among others, Agresti and Mojon (2001), Dueker and Wesche (1999) and Ormerod and Mounfield (2002). Imbs (1999) also concludes that euro-area business

cycles have moved closer together and that they are now more alike that in the immediate postwar period. His analysis, centered on the estimation of Solow residuals, permits a finer diagnosis. He concludes in particular that supply shocks are no more synchronized between European countries than elsewhere and that the observed evolution is due to demand factors. This strongly suggests that the higher synchronicity of business cycles indeed results from increasingly common macroeconomic policies and that it is not incompatible with a simultaneous tendency towards more specialization of industrial structures. For our purpose, we conclude that the fundamentals underlying European equities have changed indeed and turn to the examination of the implications of these changes for asset allocation.

4.4.3 Diversification opportunities after EMU and the practice of asset management (Part 1)

In this section we review the evidence bearing directly on the changing reality of European equity returns with the puzzling change in asset allocation paradigm as our main motivation. We approach the data in the spirit of the multi-factor methodology introduced in section 4.2.2. We start, however, by outlining our reservations with the Heston-Rouwenhorst methodology traditionally used in this context; we then show the equivalence, under the restrictive hypotheses of that methodology, of an alternative, more flexible perspective focusing on the statistical properties of country and industry portfolios or indices. We then use this alternative approach to provide new evidence on the country vs. sector debate.

4.4.3.1 On the Heston-Rouwenhorst methodology

We have observed that the message of the literature that has recently applied the Heston-Rouwenhorst methodology is ambiguous with some studies supporting the hypothesis that the basis for asset allocation has changed and others confirming the long-standing superiority of country based allocation strategies. The inability of the factor method to illuminate the issue can, we believe, be attributed to two main causes. First, we hypothesize (and confirm later on) that the underlying relations have a strong cyclical component that makes it difficult for standard econometric time series methods to clearly identify structural changes of recent history (as are bound to be those associated with the euro). Second, the fundamentals evidence reviewed in section 4.1 makes us suspicious that the Heston-Rouwenhorst equation on which most of this literature is based is misspecified. The Heston-Rouwenhorst approach indeed imposes that any given firm belongs to a single country and a single industry with a constant exposure to the corresponding country or industry factor. This hypothesis is highly disputable in the face

of the trend toward multinational firms and the reality that many firms have outputs or inputs connected with multiple industries.

This difficulty is evident in the task of Industry Classification Standard providers as highlighted in MSCI-S&P joint GICS (Global Industry Classification Standard) publications. The classification of companies into given sectors proves increasingly difficult with many business segments contributing to the turnover or the operating income, the criteria used to typify companies. Assigning a country to a company has become equally tricky with the country of origin or the country where the company is actually headquartered having often very little to do with the geographical areas that effectively influence the business of the company. Recent corporate stories, such as the Mannesman – Vodaphone acquisition, provide a vivid illustration. In this latter example, the company was "removed" from Germany to become a UK firm! Intuition would rather suggest that both countries (and probably others as well) have an influence on the operating performance of this company.

Our position receives further support from the observation that if the restricted Heston-Rouwenhorst model were true, the covariance of stock returns would show non-zero terms only for stocks in the same sector or belonging to the same country. This is far from being the case. To illustrate, the correlation matrix that we use in the next section correspond to a higher level of disaggregation where we identify 77 country-sectors within EMU (The unit is a sector in a country). This matrix include 2,926 (77*76/2) independent correlations, out of which only 41 are less than 0.1 in absolute value during the first part of the sample, while only 68 correlations were less than 0.1 during the second part of the sample!

The final evidence we want to mention in support of our position comes from a recent paper by Brooks and Del Negro (2002). These authors similarly argue that there are reasons to believe that the exposure to a country factor may vary across firms in the same country, as some are more international than others. They go on to test this hypothesis and to unambiguously reject the constraints that the coefficients to own country factors are all unity.

For this variety of reasons, we propose to approach the data with an alternative methodology consistent with an unrestricted model simply stating that a security can be subjected to multiple sources of uncertainty owing to its multinational character (more than one country) and/or because it is a conglomerate operating in more than one sector

(or, more generally, because its performance depends on the price of inputs originating in other industries than its own).

4.4.3.2 Factors vs. Portfolios

At this point, it is worthwhile clarifying the link between the above discussed factor analysis and optimal asset allocation strategy. First, one should be clear on the fact that *in fine,* the question of which factor dominates is of academic interest if knowledge of this fact does not permit designing more appropriately diversified portfolios. One can thus view the debate in the following light. Let n be the number of stocks making up the investment universe under consideration, and let us index them as i = 1,2, ..,n. These stocks can be repackaged into portfolios or indices along geographical lines, these are the country indices, C, or along industrial lines to form sector or industry indices, S. To make our life simple, assume there are only two countries, A and B, with two broad sectors/industries, a and b. The two industries are present in both countries. The stocks listed in country A (B) will be indexed as $i, j \in A\,(B)$; similarly $i, j \in a\,(b)$ denote the stocks belonging to sector a (b). The question at stake is whether $\{C_A, C_B\}$ are a better base for diversification than $\{S_a, S_b\}$. In this section, we will consider that this is the case if $cov(C_A, C_B) < cov(S_a, S_b)$. In other words, country indices will represent a better base for diversification only if the associated covariance matrix is lower (in a statistical sense) than the one associated with sector indices. In the following section we will go one step further to take account of average returns in addition to measures of the covariation in returns.

In a two-country, two-sector and n-asset world, stock returns can be assumed to follow the following return generating process:

$$r_i = c_i + \alpha_i \varepsilon_A + \beta_i \varepsilon_B + \delta_i \eta_a + \gamma_i \eta_b + u_i$$

Here, c_i and u_i are the specific, non-random and random respectively, components of the return on an individual stock; ε_A and ε_B are the (identically distributed) country factors; η_a and η_b are the (identically distributed) industry or sector factors. It should be noted that all the factors and u_i are time-indexed and we assume that factors are orthogonal. The β's are the sensitivities to country factors. One may hypothesize that $\alpha_i > \beta_i$ for $i \in A$ and reciprocally for $i \in B$. The Heston-Rouwenhorst type of literature has adopted a more restricted version of the above return generating process by assuming that $\beta_i = 0$ for $i \in A$ and $\alpha_i = 0$ for $i \in B$. The corresponding hypotheses may be entertained for δ and γ which stand for the sensitivities to sectors a and b respectively.

With this notation, country (C) and sector (S) indices are naturally represented by

$$C_A = \sum_{i \in A} r_i, C_B = \sum_{i \in B} r_i, S_a = \sum_{i \in a} r_i, S_b = \sum_{i \in b} r_i$$

One then obtains

$$\text{cov}(C_A, C_B) = \text{var}\,\varepsilon(\sum_{i \in A} \alpha_i \sum_{j \in B} \alpha_j + \sum_{i \in A} \beta_i \sum_{j \in B} \beta_j) + \text{var}\,\eta(\sum_{i \in A} \delta_i \sum_{j \in B} \delta_j + \sum_{i \in A} \gamma_i \sum_{j \in B} \gamma_j)$$

Similarly,

$$\text{cov}(S_a, S_b) = \text{var}\,\varepsilon(\sum_{i \in a} \alpha_i \sum_{j \in b} \alpha_j + \sum_{i \in a} \beta_i \sum_{j \in b} \beta_j) + \text{var}\,\eta(\sum_{i \in a} \delta_i \sum_{j \in b} \delta_j + \sum_{i \in a} \gamma_i \sum_{j \in b} \gamma_j)$$

At this point it is worth noticing that, in general, both covariances depend on both variances. Thus, if integration means smaller var ε (that is, the orthogonal component of the country factors become less important), then one would expect that both covariances, and not only the covariance of the country indices, should be affected. Even if var ε < var η – the country factor explains a smaller proportion of the variance of returns – we could have,under certain circumstances, $\text{cov}(S_a,S_b) > \text{cov}(C_A,C_B)$ – that is, country portfolios remain a better basis for diversification. The condition for this to be the case is given in Appendix B.

Now, when the restricted Heston-Rouwenhorst version of the model is maintained, whereby one imposes that $\beta_i = 0$ for $i \in A$ and $\alpha_i = 0$ for $i \in B$, the above expressions simplify to:

$$\text{cov}(C_A, C_B) = \text{var}\,\eta(\sum_{i \in A} \delta_i \sum_{j \in B} \delta_j + \sum_{i \in A} \gamma_i \sum_{j \in B} \gamma_j)$$

and

$$\text{cov}(S_a, S_b) = \text{var}\,\varepsilon(\sum_{i \in a} \alpha_i \sum_{j \in b} \alpha_j + \sum_{i \in a} \beta_i \sum_{j \in b} \beta_j)$$

Thus, one clearly obtains

$$\text{var}(\varepsilon) < \text{var}(\eta) \Rightarrow \text{cov}(C_A,C_B) > \text{cov}(S_a, S_b).$$

That is, in a setup where the asset manager is constrained to elect between a country or a sector dimension, whenever the fraction of the total variance explained by country factors becomes smaller than the fraction of variance explained by industry factors, the first step of an optimal asset allocation should be done at the level of sector or industry indices (and conversely).

With this result at hand, we now turn to the evidence that can be obtained directly at the level of country or sector indices. If the hypotheses behind the Heston-Rouwenhorst approach are valid, this evidence should provide a converging view on the evolution of equity returns. And by working at this level but using the concept of dispersion of returns rather than correlations, we will be in a position to better take account of the time changing dimension of the relationships under study. Furthermore, if as we have hinted the restricted Heston-Rouwenhorst hypotheses turns out to be invalidated, our approach remains operative as it directly bears on one important dimension of the practice of asset management.

4.4.3.3 Evaluating the emerging superiority of industry portfolios

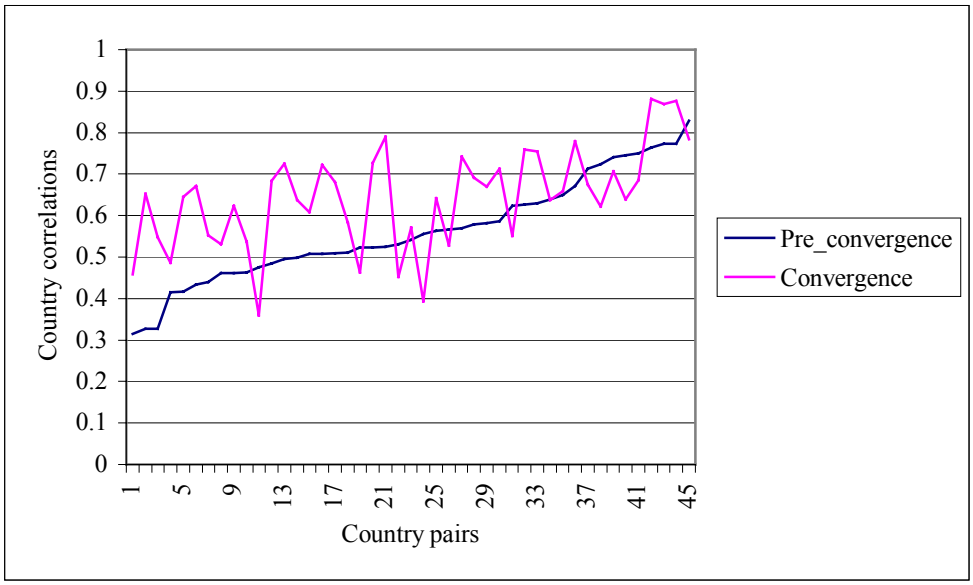
We now directly look at the statistical properties of equity returns working at the level of country or EMU-wide sector indices. We first adopt a medium run perspective and compare correlations among indices across two "long" sub-periods: one labeled pre-convergence (to the euro) goes from May 1987 to December 1994 while the second, labeled convergence, goes from January 1995 to August 2002. The data used here are the Datastream equity indices for countries and EMU global sectors[3]. The evidence is summarized in Figures 4.11 and 4.12. Figure 4.11 illustrates the evolution of pairwise correlations between country portfolios (or indices) over the period to August 2002. Pairwise correlations are computed for the first part of the sample and the results are ranked from lower to higher. The corresponding correlations are then plotted for the second part of the sample. The results are striking and appear to support the view that, possibly as result of the convergence of macro fundamentals, country indices have converged, implying a loss in diversification opportunities at the country level. Note that this result is statistically significant and robust to the definition of the convergence period[4]. By contrast, Figure 4.12 shows that the correlations between global sectors have

[3] We use Datastream data anticipating our next step which will consist of working at a higher level of disaggregation where indices are defined by their twin country and industry dimensions. MSCI indices are not available at this level.

[4] In particular Adjaouté and Danthine (2001a) confirm this result with the break point defined as August 1997 and the pre- and post-convergence periods defined as 11-1995 to 08-1997 and 08-1997 to 04-1999 respectively.

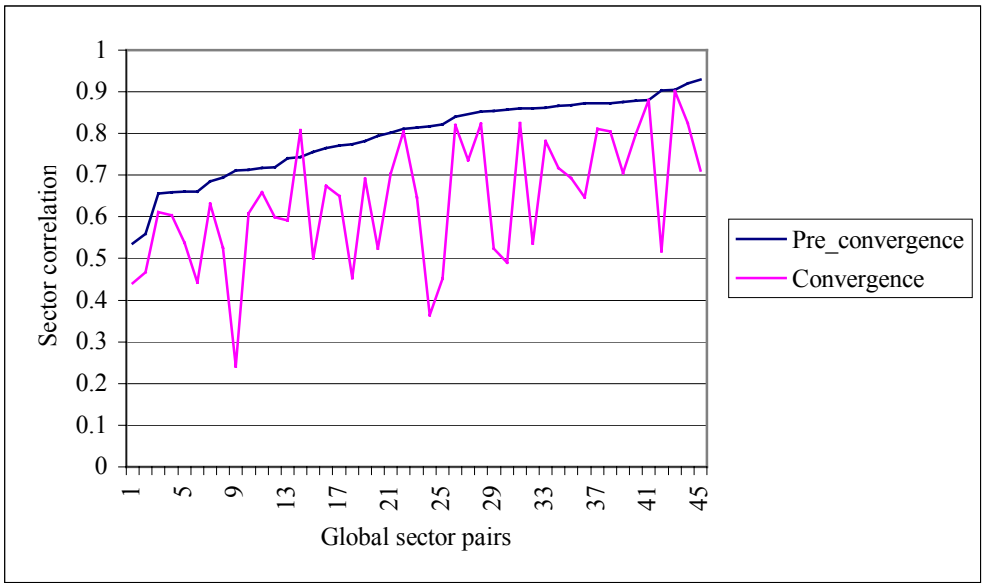
decreased. Indeed, while the average country correlation has gone from 0.56 in the pre convergence period to 0.64 in the convergence period, the average correlation of global EMU sectors has decreased from 0.79 to 0.64.

Figure 4.11: Country Index Pair Correlations: Pre-convergence vs. Convergence



Source: Datastream

Figure 4.12: EMU Global Sector Correlations: Pre-convergence vs. Convergence

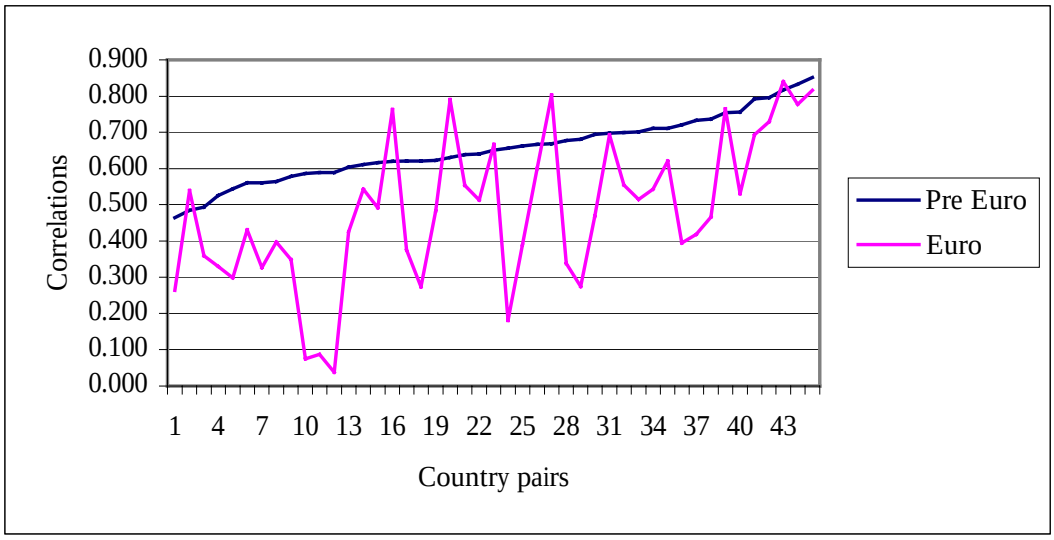


Source: Datastream

These results appear to be consistent with variance decompositions indicating the end of the superiority of the country factors. Before jumping to conclusion, however, we now take a shorter run perspective and repeat the exercise focusing on the post-euro period

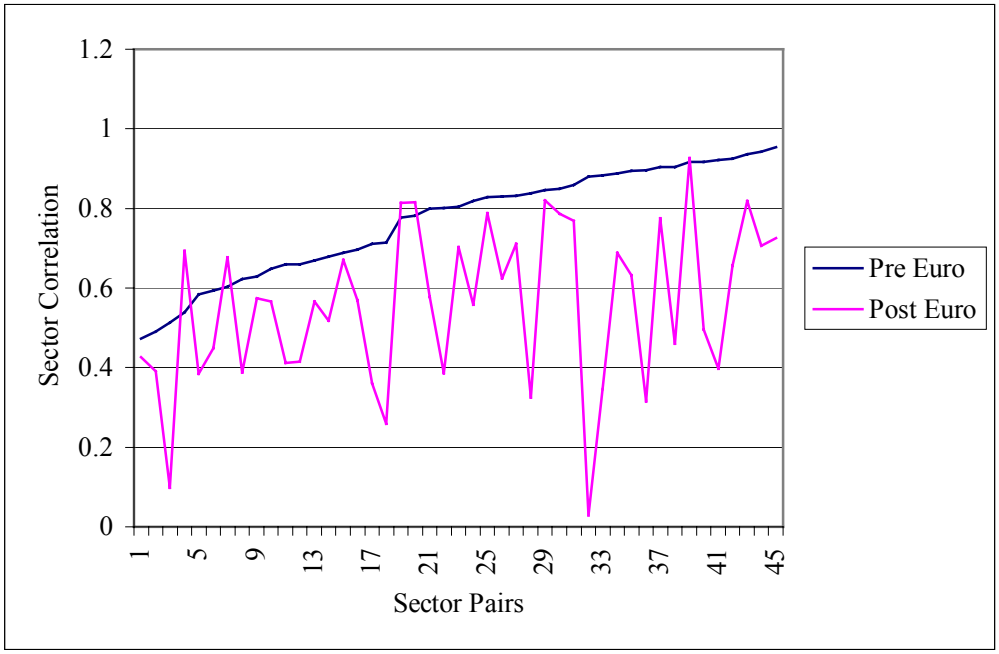
stricto sensu and on the period of corresponding length that has preceded it. The results are displayed in Figures 4.13 and 4.14. While Figure 4.14 confirms that correlations among global sector indices are indeed lower in the euro period, the previously obtained conclusion is reversed in the case of country indices. Country correlations appear to have decreased over the euro period in comparison with the preceding two years. One may conclude from this first set of results that equity return relationships are highly time-varying. Caution is thus required before drawing conclusions, in particular, before concluding at the responsibility of structural factors such as financial integration or changes in macro fundamentals for observations on equity returns made over short samples.

Figure 4.13: Evolution of Country Pair Correlations: Pre-euro vs. Euro



Source: Datastream

Figure 4.14: Global EMU Sector Correlations: Pre-euro vs. Euro



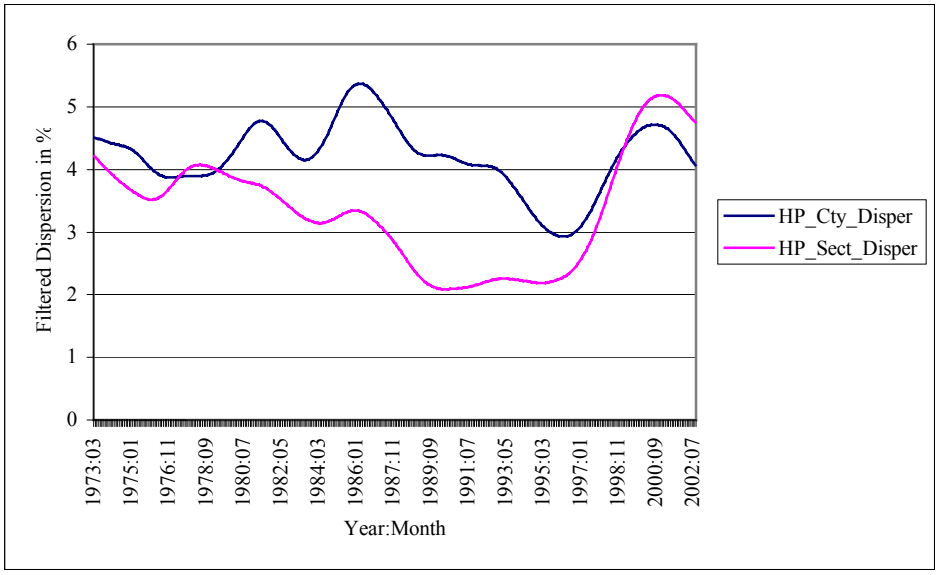
Source: Datastream

The nature of the relationships under scrutiny suggests appealing to different descriptive methods permitting to better illuminate their time-varying dimension. This is why we turn again to the concept of cross-sectional dispersion. The global correlation/dispersion is particularly useful in that it can be generated as a time series for the available frequency of return data. It reports on instantaneous relations involving no time averaging and thus allows for a more thorough investigation of the evolution of the diversification opportunities in the EMU zone. The time series of raw country return and global sector return dispersions are displayed as Figures A and B in Appendix C. They are highly time-varying while also following some cycles. The more interesting cyclical pattern appears clearly if one filters the series to extract their slowly moving components. We use a standard Hodrick – Prescot filter for this purpose. The result is displayed in Figure 4.15 where the two series are shown together.

This analysis is revealing. Dispersions, indicative of instantaneous correlations, are highly time-varying in confirmation of the observations made on correlations. In addition, they appear to follow cycles. Both country and sector dispersions have displayed a downward trend until the fall of 1996, an evolution that Adjaouté and Danthine (2001b) credit for the widespread view that correlations among country indices were increasing in Europe due to European integration and that indeed diversification opportunities were being hampered.

But these dispersions have trended upward since reaching their most recent peaks around the end of 2000. By then the dispersion levels were at an all-time high for sectors and has almost matched their highest point of the mid-1980's for country indices. Thus, in contradiction to the often expressed view, the post-euro period has been very favorable for diversification within the euro-area whether on a geographical or on a sectoral basis.

Figure 4.15: Filtered Country and Global EMU Sector Dispersions



Source: Datastream

Moreover, the superiority of a country-based asset allocation was clear for most of the period (in conformity with Rouwenhorst, 1999, but not with Galati and Tsatsaronis, 2001). There appears to be a reversal in this ranking taking place in early 1999[5]. This reversal can be associated with the reversal of the variance inequality in the Heston-Rouwenhorst context uncovered by Isakov and Sonney (2001) and Galati and Tatsaronis (2001). This result is consistent with the result that the euro-area business cycle have become more synchronized, so that the orthogonal portions of the euro-area country factors are showing increasingly smaller variances. Yet, the variability of the relationships and the fact that reversals have occurred in the past (this was the case from around 1977 to 1979) suggests that caution must be exercised before definitively linking this reversal to permanent structural changes. Finally, the superiority of sector-based strategies cannot be fully established on the basis of these results as the difference between the two series is small by historical standards. In our view, these results provide only a weak justification for the change in asset allocation paradigm.

[5] The exact dating of the reversal is likely to depend on the specific filtering or data-smoothing method.

4.4.4 Diversification opportunities after EMU and the practice of asset management (Part 2)

In the previous section we have found weak support only for as important a change as observed in the asset allocation paradigm. For this reason, we push the reasoning one step further. First, we provide a more complete account of the observed evolutions of equity returns in terms of portfolio efficiency. Indeed, the discussion in terms of correlation/covariance matrices abstracts from the other side of the asset allocation equation, that is, from the vector of country or sector returns. To complete our description and try to gain a full understanding of the issue, we conduct mean-variance optimizations on country and sector portfolios. Second, we find it useful to disaggregate the data one step further. This is because, while the factor analysis has a tendency to rationalize asset allocation strategies in terms of country or industry indices, it is not clear that one can understand either strategies relative to the alternative of proceeding to a full optimization across both countries and sectors. To illustrate, why limit oneself to 10 country indices or 10 global sector indices when one could equally well use the full 10x10 matrix of what we will label "country-sector" indices?

In fact, not all sectors are available in all countries, or only for a very short time period. We thus use a sample of 77 country-sectors. Table 4.4 collects the evidence on the 77x77 correlation matrix, pre- and post-convergence. The displayed summary statistics are interesting because they do not support the view that country-sector correlations have moved in either direction: the average pre-convergence correlation is 0.407, compared to 0.406 during the convergence period. We take this to mean that what is at work is not operative at company levels but is something affecting the appropriateness (for diversification purposes) of the specific portfolio weights characterizing either country or sector indices.

Table 4.4: country- sector index correlation stats

	Pre convergence	Convergence
Minimum	-0.112	-0.064
Maximum	0.910	0.842
Average	0.407	0.406
Median	0.400	0.409

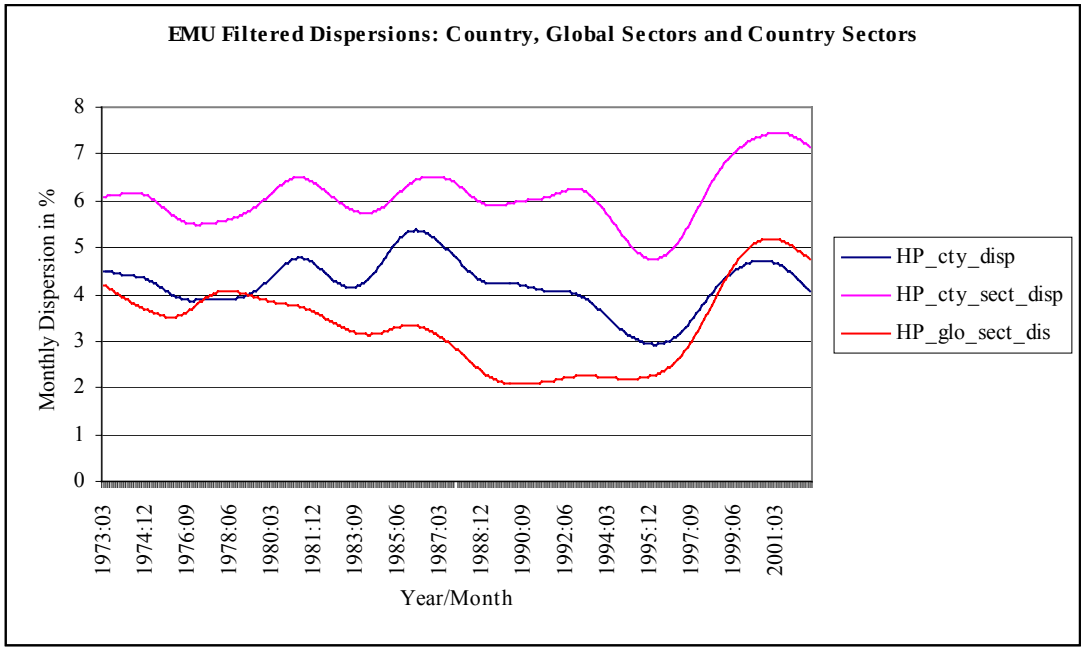
Source: Datastream

On average then, there is little room to argue for a shift in the correlation structure when country-sector indices are used. The average correlation, however, masks a particularly interesting picture of the correlation spectrum: at this level of observation, the main

regularity appears to be a tendency for bilateral correlations to revert toward the mean. The demonstration is conducted in Appendix D.

To further check the time-series properties of the country-sector indices, we next turn to the dispersion measures again meant to reflect instantaneous correlations. Figure 4.16 reports a set of interesting facts. First, country-sector indices display the same sort of cycles as observed for the country or the sector indices. Second, at the disaggregated level of country-sector, the most recent period is confirmed as a favorable period for diversification opportunities. Finally, and most importantly, it clearly appears that the diversification possibilities are always better at the country-sector level than at either more aggregated level: Country-sector portfolios have consistently been *less* correlated than country portfolios or global sector portfolios and the advent of the single currency has no impact on this reality. Now, we are aware that our dispersion measure is not market capitalization weighted, and that as a consequence the greater dispersion reported may overstate the true performance of country-sector portfolios relative to the standard country or sector portfolios. To dispel our doubts, the last step in our inquiry will consist of a more complete mean-variance analysis of the data at hand.

Figure 4.16: EMU Filtered Dispersions:Country, Global Sectors and Country-sectors



Source: Datastream

In this final step, our goal is to provide a more complete account of the observed evolutions of equity returns in terms of portfolio efficiency. As mentioned, the discussion

in terms of correlation/covariance matrices abstracts from the expected return side of the equation. The reason for this omission is straightforward. While there is some degree of stability in return correlations permitting, with caution, to approximate expected relationships with historical correlations, the same is definitely not true for expected returns. More specifically, performing mean-variance optimization exercises under the assumption that average realized returns are truly representative of ex-ante expected returns is very debatable. We will do so, nevertheless, with due caution, with the objective of testing whether at this deeper level of observation we find more support to the important changes in the practice of asset management that we have described and thus can better account for the post-euro reality of equity markets.

We conduct mean-variance optimizations on country, global sector and country-sector indices. As before, we consider two sub-samples, the first starting in May 1987 and ending in December 1994, the second starting in January 1995 and ending in August 2002. Each sub-sample is thus formed of 92 monthly returns. Table 4.5 reports the sample monthly return statistics for country and global sectors. The country-sector return statistics (77 series) are not shown here for space reasons but are readily available.

A first result is obtained on the basis of the descriptive statistics: Global sector indices have been more attractive than country indices in both sub-periods. Indeed, the average global sector return and the information ratio stand at 0.47% and 0.09 respectively, in the pre-convergence compared to 0.36% and 0.07 for country portfolios. These results are not statistically, however. They are meant as purely illustrative as they constitute only the first step in the mean-variance analysis. Notice that this result distorts somewhat the message obtained from the correlation comparisons. During the first sub-sample period, the average country correlation stood at 0.56 compared to 0.79 for global sector indices, and the literature maintains (and our analysis confirms) that country factors were dominant during that period. Of course, the average statistics have little to say on portfolio efficiency. We thus provide, in Tables 4.6, 4.7 and 4.8, the results on the optimal minimum variance portfolios and the tangent portfolios for the two sub-periods.

Table 4.5: Descriptive Statistics of Portfolios

Panel A: Country index monthly return statistics - Mean and sigma are in %

	Pre convergence period			Convergence period		
Countries	**Mean**	**Sigma**	**Info. Ratio**	**Mean**	**Sigma**	**Info. Ratio**
AUS	0.89	6.74	0.13	0.13	4.85	0.03
BEL	0.38	4.41	0.09	0.56	4.70	0.12
FIN	0.35	8.90	0.04	1.19	10.86	0.11
FRA	0.33	5.08	0.06	0.66	6.00	0.11
GER	0.36	4.61	0.08	0.44	5.91	0.07
IRE	0.56	6.34	0.09	0.90	5.73	0.16
ITA	-0.17	7.06	-0.02	0.56	6.94	0.08
NET	0.50	3.52	0.14	0.69	5.73	0.12
POR	-0.05	4.78	-0.01	0.41	6.24	0.07
SPA	0.42	6.03	0.07	0.78	6.38	0.12
Average	**0.36**		**0.07**	**0.63**		**0.10**

Panel B: Global Sector monthly return statistics - Mean and sigma are in %

	Pre convergence period			Convergence period		
Global Sectors	**Mean**	**Sigma**	**Info. Ratio**	**Mean**	**Sigma**	**Info. Ratio**
BASIC	0.37	5.53	0.07	0.50	5.61	0.09
CYCG	0.00	6.22	0.00	0.32	7.00	0.05
CYSE	0.48	5.55	0.09	0.45	6.13	0.07
GENI	0.31	5.68	0.05	0.57	6.20	0.09
ITECH	0.62	6.26	0.10	1.20	11.53	0.10
NCYC	0.67	4.81	0.14	0.98	4.25	0.23
NCYS	0.68	5.43	0.13	0.73	7.97	0.09
RESOR	0.66	4.78	0.14	0.90	5.76	0.16
TOTLF	0.14	4.85	0.03	0.61	6.09	0.10
UTILS	0.76	3.94	0.19	0.54	4.10	0.13
Average	**0.47**		**0.09**	**0.68**		**0.11**

Source: Datastream

In the optimization, we allow for short selling because the imposition of no short selling restrictions would lead to the exclusion of major EMU countries (France, Germany, etc…) or major sectors. When the optimization is on country-sector indices, implied country weights and implied global sector weights are derived and shown in Appendix B. Focusing first on the country portfolios, one can effectively see that the first period performance of both the minimum variance and the tangent portfolios is better compared to the convergence period. The picture is different for global sector portfolios. The performance of the global sector minimum variance portfolio has improved during the convergence period but the opposite is true for the tangent portfolio. Of most interest is that the Sharpe ratio of the optimal portfolios composed on the basis of sector indices is always superior to the Sharpe ratio of the optimal portfolios made of country indices. Repeating the warning signals already issued and thus proceeding with utmost caution, we conclude nevertheless that standard mean-variance analysis thus leads us to qualify the

assessment made on the basis of covariances or factor analysis and provides stronger support to the changing asset allocation paradigm: yes, country indices have for long constituted a better basis for asset allocation, the reversal has occurred only very recently and it is not overpowering. If however one takes on board the message from average returns, there is a distinct possibility that, for a much longer period, portfolio weights implicit in sector indices have been more conducive to portfolio performance than the portfolio weights implicit in country indices. This reality, possibly not fully anticipated but learned about from experience, may thus explain the change in paradigm. And the euro may have been the facilitator or the catalyst, the one-off event that has made it possible or, at least, easier to take the new reality into account.

Table 4.6 Country Mean-Variance Optimization Results

Country	Minimum Variance Portfolio		Tangent Portfolio	
	Pre convergence	Convergence	Pre convergence	Convergence
AUS	0.01	0.42	0.69	-1.28
BEL	0.11	0.50	-0.17	0.76
FIN	-0.17	-0.01	-0.37	0.34
FRA	-0.27	0.16	-0.31	1.11
GER	-0.07	0.09	-1.00	-2.06
IRE	-0.26	0.25	-0.10	1.34
ITA	0.09	0.01	-0.28	-0.43
NET	1.25	-0.38	2.64	0.71
POR	0.24	0.15	-0.58	-0.29
SPA	0.07	-0.20	0.48	0.80
TOTAL	1.00	1.00	1.00	1.00
Expected Return	0.36	0.35	1.51	2.45
Risk	2.934	4.142	6.001	11.007
Sharpe	0.123	0.084	0.251	0.222

Table 4.7: Global Sector Mean-Variance Optimization Results

Sector	Minimum Variance Portfolio		Tangent Portfolio	
	Pre convergence	Convergence	Pre convergence	Convergence
BASIC	-0.04	0.23	0.16	-0.06
CYCG	-0.06	-0.21	-0.84	-0.54
CYSE	-0.60	0.21	-0.71	-0.06
GENI	0.05	-0.18	-0.43	-0.24
ITECH	0.06	-0.12	0.51	0.19
NCYC	0.36	0.56	1.29	1.47
NCYS	-0.18	0.15	0.92	0.19
RESOR	0.35	0.20	0.32	0.49
TOTLF	0.21	-0.21	-1.47	-0.44
UTILS	0.84	0.37	1.26	0.02
TOTAL	1.00	1.00	1.00	1.00
Expected Return	0.77	0.80	2.35	1.62
Risk	3.394	3.285	5.911	4.658
Sharpe	0.228	0.245	0.397	0.347

Source**:** Datastream

Table 4.8: Country-Sector Mean-Variance Optimization Results

	MV Portfolio	Tangent Portfolio
Expected Return	0.86	4.32
Risk	0.693	1.558
Sharpe	1.234	2.770

Source; Datastream

The plot thickens, however, if one now considers the possibility of investing at a more disaggregated index level by forming portfolios of country-sector indices. The Sharpe ratios of both the minimum variance and the tangent portfolios are an order of magnitude higher than those of the previously formed optimal portfolios. Note here that the data prevent us from optimizing for the first part of the sample period, as for some country-sector indices, the data history is too short.

Our results are not surprising. Standard portfolio analysis cannot justify imposing restrictions on portfolio weights such as those enforced when one considers either the country indices or sector indices as the building blocks of asset allocation. In this sense, asset managers should be doing a simultaneous asset allocation along both country and sector dimensions and the euro has nothing to add to this. These results are fully in accord with those provided by the spanning literature. Spanning tests ask the following basic question: what happens to the efficient frontier constructed on the basis of country portfolios when industry portfolios are added to the investment universe? And reciprocally? The answer, which is consistent with earlier evidence, is that the allocation is improved by taking both views (Ehling and Ramos, (2002)): countries add to sectors and sectors add to countries. Ramos (2002) provides the analytics. She constructs a two-country, two-industry and four-asset model in which two sets of portfolios can be built: constrained portfolios which can only invest in country or industry indices and unconstrained portfolios which can invest in both indices. The theoretical results support the empirical results showing that the performance of the constrained portfolios is inferior to the performance of their unconstrained counterparts, or else, that the performance of unconstrained portfolios is altered if one or more components are excluded from the optimization. This is a logical outcome since the primitive assets' returns are assumed to be generated by a two-factor model, where the factors represent country and industry dimensions. Since almost all empirical studies have found both country and industry factors to be present in European stock returns, it follows that a two-dimensional asset allocation approach is more appropriate. These results are also in line with those of Gérard, Hillion and Roon (2002) who obtain that “in the absence of short sales restrictions, international portfolios based on either countries, industries, or ICAPM portfolios are always inefficient relative to each other”.

In sum, within the standard top-down paradigm, we do provide support to the view that, despite a long and rich literature asserting the superiority of country factors in variance decomposition exercises, the euro area reality has been altered possibly as a result of economic and financial integration. Taking account of average returns, and not only of correlations, and using the lens of portfolio optimization clearly strengthen the rationale for the paradigm change[6].

Yet, full optimization also confirms another strand of the literature arguing that the cost of the standard aggregated approach may well be substantial in terms of portfolio performance. How can we make sense of this? One obviously has to assume that a two-step allocation is costlier than a one-step strategy. Small players can only afford one step. Viewed from the spanning test methodology à la Ramos, these findings suggest that the changes that have taken place imply the one-step should now be industry. That is, the marginal diversification gain of adding an extra layer of optimization at the country level is smaller than when the first step is country and the extra-layer is industry.

While these costs may be understood when placed in the larger context of the costs of doing active portfolio management in a multi-industry international setting, they are hard to rationalize in the context of passive strategies. The growth of indexing and the development of ETF's may be highly relevant in this context and augur of significant performance improvements for European investors.

5. Conclusions: winners, losers, and the challenges ahead

Our discussion has made it clear that the euro together with the accompanying structural changes described in the introduction has not been the minor event that some had predicted. In this concluding section, we look at the winners and the losers of the recent changes and underline some of the outstanding challenges. We take successively the viewpoint of the governments, the firms and the consumer-investors of the euro area.

[6] Gérard, Hillion and Roon (2002) however point out that short sales restrictions may be more damaging for industry based portfolios than for country based portfolios and that when such restrictions are implemented the superiority of industry portfolios in terms of Sharpe ratio may well disappear.

5.1 Governments.

The evolution of government bond markets in the euro area has been spectacular. Euro-area governments are now able to finance themselves at rates that are both lower and more stable than in the period preceding the euro. While the macroeconomic conditions may change and financial integration does not mean that interest rates will remain low, theory suggests that lower spreads relative to the benchmark and lower interest rate volatility are structural improvements on which governments may count in the future. This implies that for most public authorities refinancing conditions have permanently improved.

The key remaining issue is the question of whether a single public debt market for the euro area is within reach. As discussed in section 3.4, the current fragmentation is partly the result of market microstructure considerations for which further measures of financial integration are the appropriate remedy; but there is also the possibility that it is the result of coordination on the bad equilibrium in a multiple equilibria situation, in which case it is less clear which set of measures would be appropriate and whether they would be successful. In other words, it is quite possible that, short of the establishment of a single issuing agency for public securities in the euro area, the benefits of a fully integrated market will not obtain. The current situation is not without benefits. Competition among European Treasuries ensures that the needs of investors are scrutinized and met with diligence. But what can be seen as a failure of financial integration has also a cost, that one may judge to be unnecessary. If one sets at 20 basis points the cost of this failure for all euro-area public treasuries except the German, the cost can be estimated at € 5 billion per year.

5.2 Firms

We have seen in section 4.4.1 that one pre-condition for the equity risk premium to decline as a result of integration was met. This provides prima facie evidence that the cost of equity capital for European firms will be lower, ceteris paribus, in an integrated euro area. Whether such a decrease has effectively materialized and whether it can effectively be measured is an open question. Indeed, while these effects are potentially of first-order importance in the long run, it is not clear that they are detectable over the time frame we are talking about and in the context of the progressive changes taking place in Europe. In the more dramatic case of the opening of financial markets of emerging economies, Stulz (1999) finds it difficult to detect strong effects of liberalization on the cost of capital. He argues interestingly that the existence of the home bias may well be the factor limiting the extent of the cost of capital decrease in the situations he analyzes. Yet Hardouvelis et al. (2001) provide a bullish empirical assessment of how the single currency has affected the

cost of capital in the euro-area. These authors use a standard CAPM with EMU and local factors and show that EMU factors have become more important than local ones. Since the covariances of firms with EMU factors are generally lower than with local factors, they conclude that the cost of capital must have decreased. They also show that the cost of capital for firms within the same sector has converged across countries. We conjecture that the convergence of risk-free rates, displayed in Figure 3.1, may well be the dominant factor in this assessment.

The importance of microstructure considerations in the case of highly homogeneous assets such as public bonds suggests similar considerations are also at work, probably with more force, in the case of equities. There are strong reasons to believe that the current fragmentation of stock exchanges in Europe implies that firms with similar characteristics are priced differently and, as a consequence, experience a cost of equity capital that varies. Such differences introduce costly distortion in the allocation of investments.

5.3 Consumers and investors

As taxpayers, consumers do benefit from the more favorable circumstances under which European governments are able to finance their expenditures. Debt markets are zero sum, however, and if governments pay less on the securities they issue, the holders of these securities also receive less. These are likely to be the more risk averse investors who hold a disproportionate share of government securities in their portfolios. They are also the future retirees whose pension funds produce smaller returns. This assessment has to be qualified to the extent that the lower returns correspond to lower inflationary expectations and more generally altered fundamentals.

The decrease in firms' cost of capital means that more investment projects pass the hurdle rate and that in particular riskier, high expected return projects can be financed more advantageously. One expects this to be favorable for investment and output and for economic growth. This is not a zero-sum game and everyone will benefit from these developments, among others, the holders of claims on non-capitalized pension schemes.

As we have noted before, these changes in the reward to risk taking also have potentially important implications for the industrial structure of an economy as some firms may see an increase in their cost of financing while most others see a decrease. Activities previously valued for their contribution to economic diversification may see their premium decline or disappear. Such reallocations of activities are often painful implying job creations but also job destructions. For individual workers, the transition may be hard,

to the point where some of the changes, although welcome in the long run, will be opposed in the political arena. Europe is not foreign to this reality.

For private investors, financial integration represents an improvement in diversification opportunities. Facilitated cross-border investments make it less costly to achieve international diversification. While there are clear signs of this happening, it still is the case that European investors remain home biased and that further measures permitting to decrease the cost of cross-border investments are called for. One of the most obvious positive changes brought about by the euro was the automatic lifting of currency matching rules for institutional investors. Important gains in diversification, ultimately reaped by investors and consumers, are expected from this change and the evidence confirms that the new opportunities are being exploited. Of course the benefits of these changes have to be measured in the long run abstracting from the current state of equity markets.

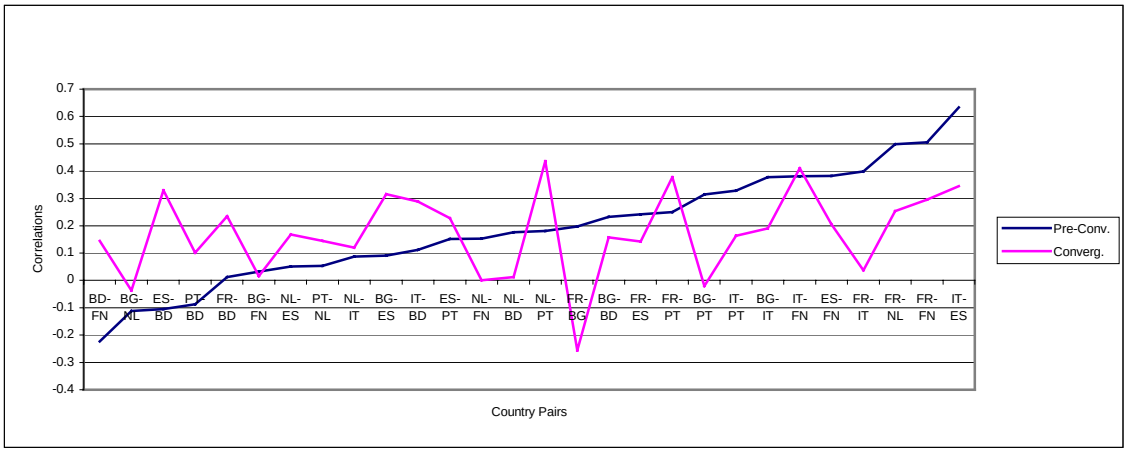
We have spent time trying to understand the reasons for the change in the asset allocation paradigm. This change may have some indirect effects on the home bias. The optimists will argue that the new sectoral approach to asset allocation is a strong antidote to the home bias. This is because global sector indices are by definition impervious to national considerations and the reliance on these indices at the first stage of the asset allocation process will automatically force investors towards a more international outlook. The pessimists will argue on the contrary that once the optimal sector allocation has been defined, it will be natural for investors to try to fill in the grid with home stocks belonging to the required industries, something that will be possible in a majority of cases. Of course, doing so systematically would lead to going further away from an optimal geographical diversification.

Portfolio theory has been one of the areas of economics where academics have been successful at taking a normative stance. With the hope that this success will continue, a review of the facts and the theories cannot be concluded without questioning the appropriateness of current asset allocation practices. There is probably no role for policy here. Yet it may well be the domain under review where welfare gains would be most substantial. There are clear indications that the step-by-step top-down asset allocation process commonly adopted forgoes major diversification gains and, as argued above, there is no guarantee that the current paradigm change will affect this reality. To the extent that this restricted approach is the result of a cost optimization procedure and that the size of asset management units is at issue, cross-border integration of asset managers may be the way forward. More affordable is the development in Europe of passive investment, a

move that should be facilitated by the growth of new instruments such as Exchange Traded Funds.

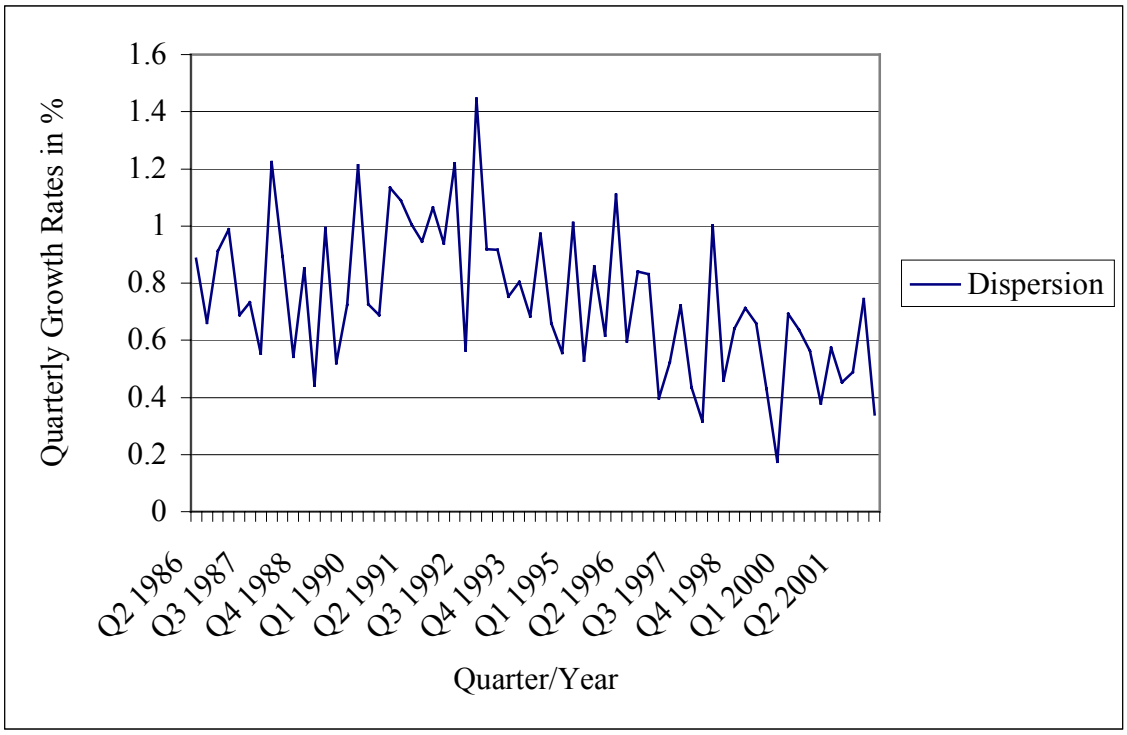
Now, the definitive measure of the convergence of pricing kernels and of the relevance of financial integration for all consumer-investors would be an increase in the correlation of consumptions! Figure 5.1 displays pairwise country correlations of consumption for the euro-area for two periods defined as preceding convergence - 1986-1994, and during convergence - 1995 and 2002. The pattern is dominated by a tendency of correlations to return toward the mean, that is low correlations in the first period are typically followed by higher correlations in the second and conversely. In Figure 5.2, we resort once again to the concept of cross-sectional dispersion to have a better perspective on this matter. Here, it appears rather clearly that the dispersion of consumption growth rates exhibits a downward trend at least since the early nineties. That is, consumption growth rates are increasingly correlated in the euro-area. The average dispersion in the first part of the sample is 0.87 while it falls to 0.62 in the second part. At first sight, this is a welcome support to the idea of the convergence of pricing kernels. We have to remember, however, that a similar pattern has been found for the growth rates of GDP and the observations on consumption may simply be the mechanical consequence of the increased synchronization of output. In addition, the correlations between consumption growth rates in the euro area remain smaller than the correlation of GDP growth rates suggesting that risk sharing opportunities are far from being fully exploited. Complementary evidence is provided by Adam et al. (2002) who reject the hypothesis that consumption growth rates are unaffected by idiosyncratic changes in GDP growth rates as would be the case under perfect risk sharing among members of the euro area. European policy makers may however take comfort from the fact that, by this very demanding measure of integration, the US is not an integrated financial area either.

Figure 5.1: Evolution of Country Pair Correlations (Consumption Growth Rate) – Before and During Convergence



Source: Datastream

Figure 5.2: Quarterly Consumption Growth Rate Dispersions



Source: Datastream

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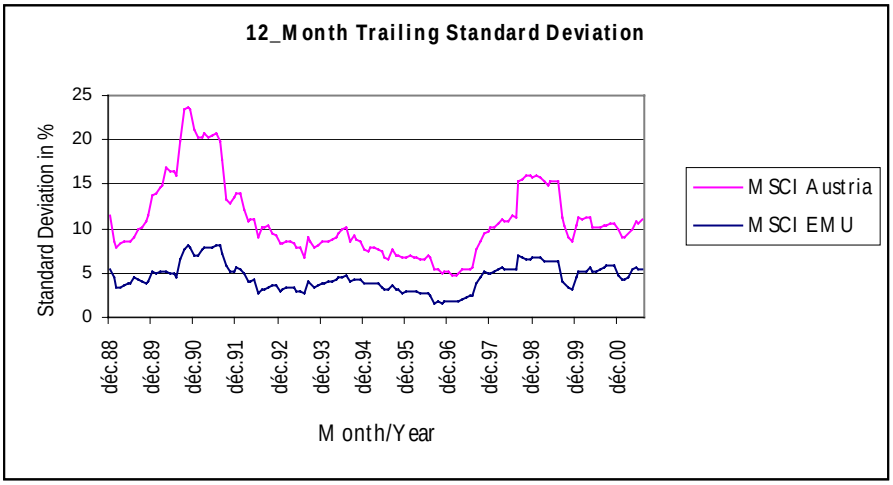
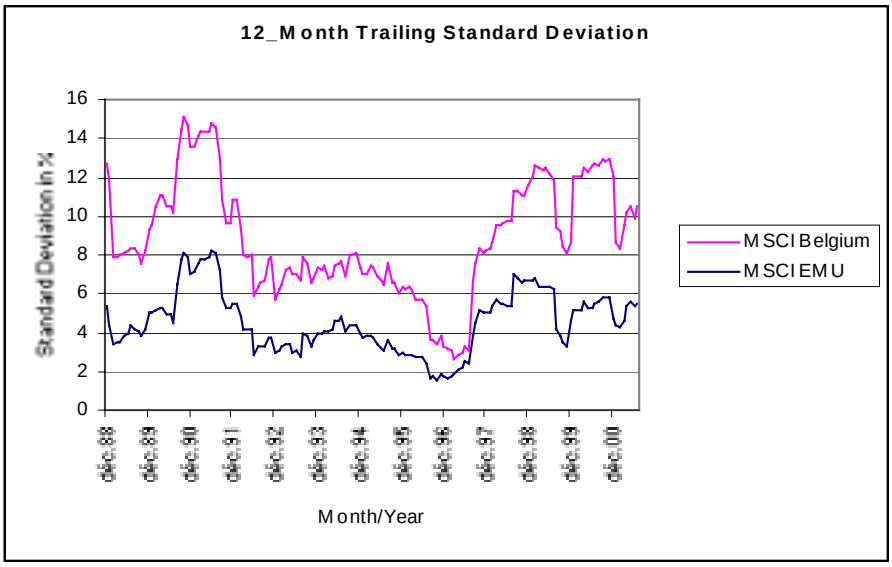
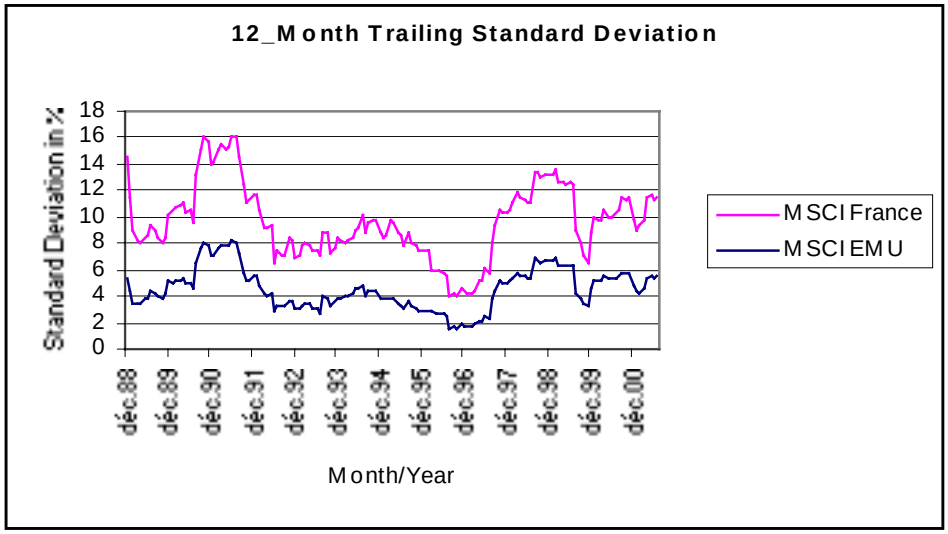
Appendix A: Standard Deviation of National Market Indices vs. MSCI EMU



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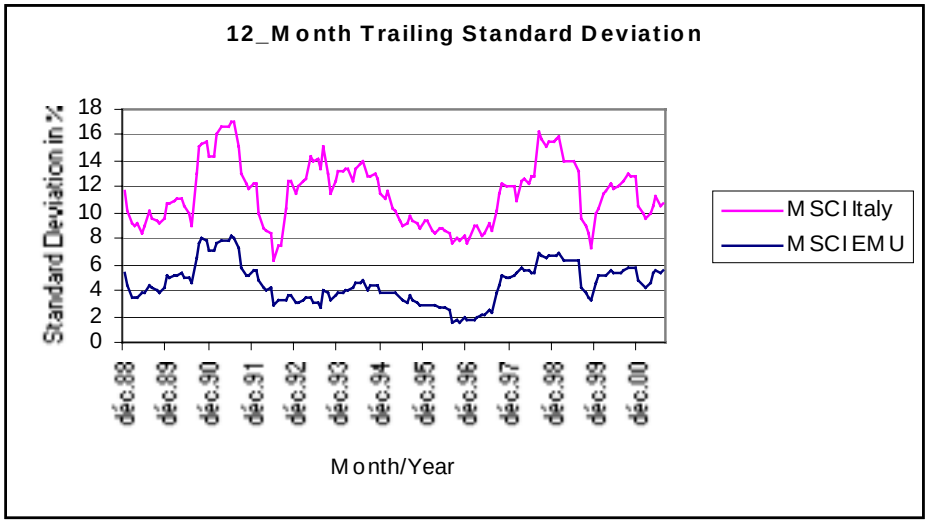
MSCI EMU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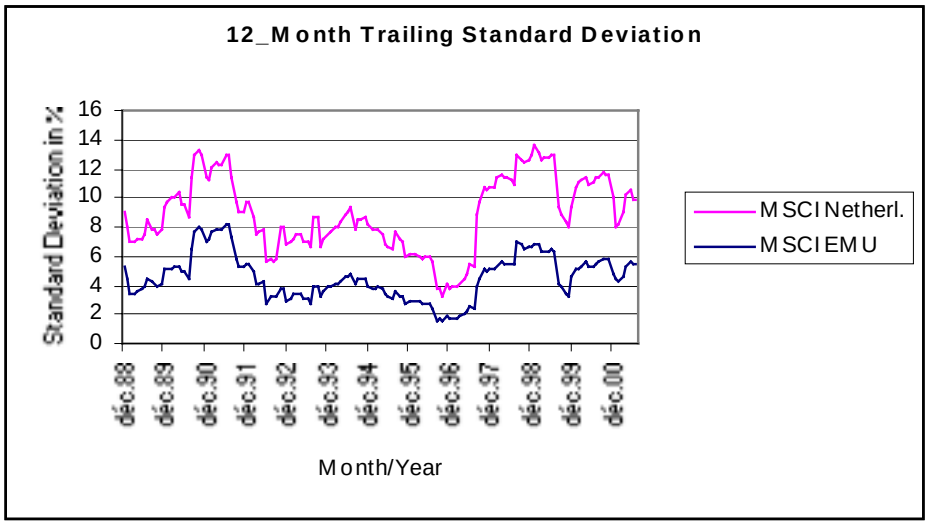
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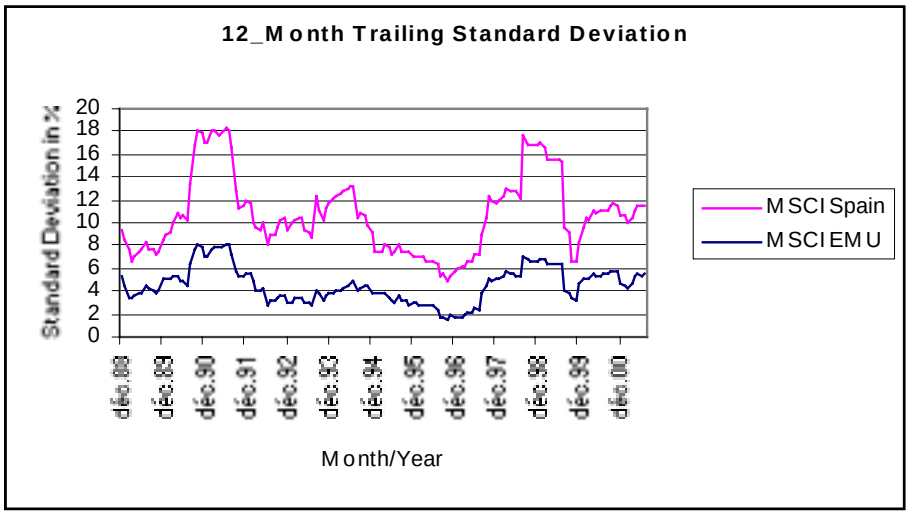
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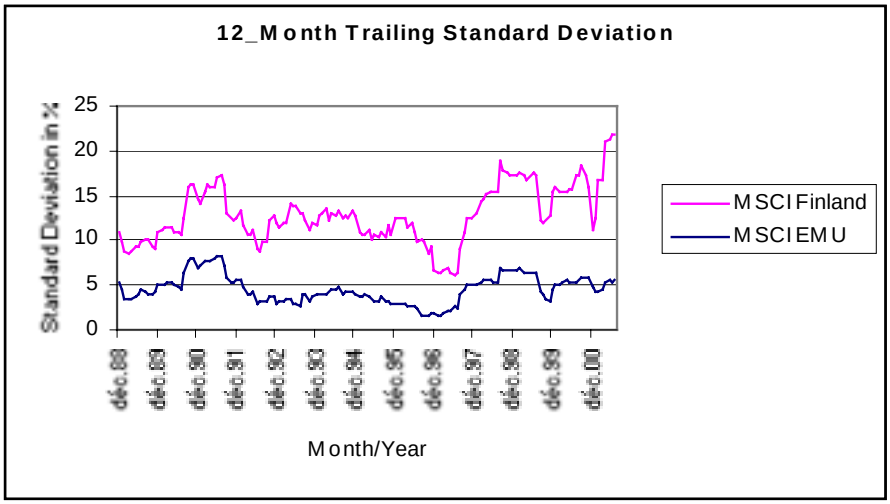
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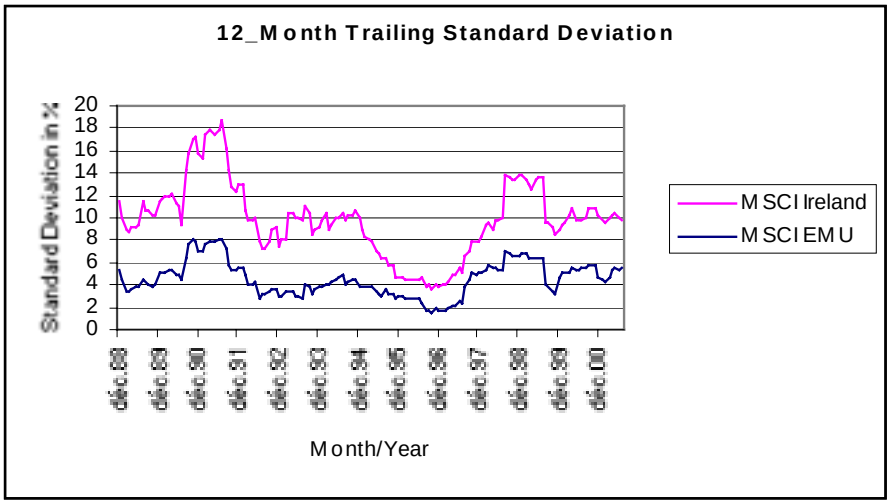
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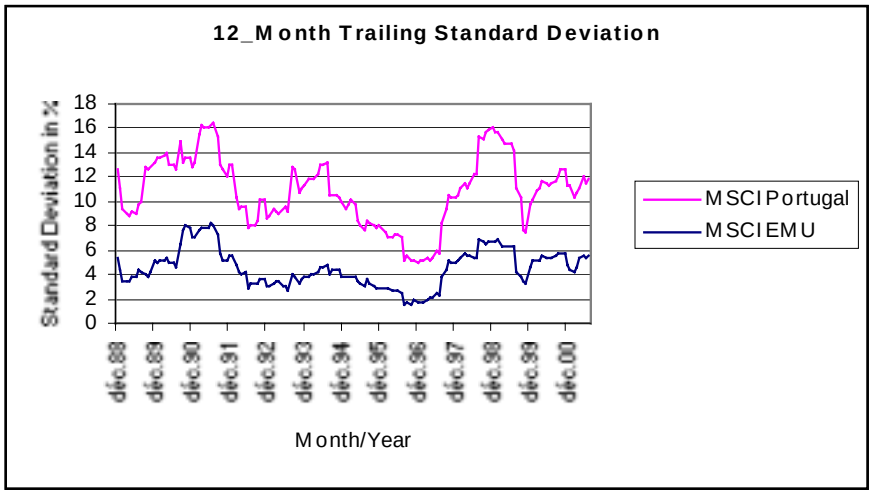


Appendix B: Condition for a non monotonous relation between covariances of sector and country indices and the variance decomposition

We have stated that even if var ε < var η – the country factor explains a smaller proportion of the variance of returns – we could have,under certain circumstances, cov(S_a,S_b) > cov(C_A,C_B) – that is, country portfolios remain a better basis for diversification. The condition for this to be the case is

$$\operatorname{var}\varepsilon\left(\sum_{i\in A}\alpha_i\sum_{j\in B}\alpha_j+\sum_{i\in A}\beta_i\sum_{j\in B}\beta_j\right)+\operatorname{var}\eta\left(\sum_{i\in A}\delta_i\sum_{j\in B}\delta_j+\sum_{i\in A}\gamma_i\sum_{j\in B}\gamma_j\right)$$
$$<\operatorname{var}\varepsilon\left(\sum_{i\in a}\alpha_i\sum_{j\in b}\alpha_j+\sum_{i\in a}\beta_i\sum_{j\in b}\beta_j\right)+\operatorname{var}\eta\left(\sum_{i\in a}\delta_i\sum_{j\in b}\delta_j+\sum_{i\in a}\gamma_i\sum_{j\in b}\gamma_j\right),\ \text{or,}$$
$$\operatorname{var}\varepsilon\left(\sum_{i\in A}\alpha_i\sum_{j\in B}\alpha_j+\sum_{i\in A}\beta_i\sum_{j\in B}\beta_j-\sum_{i\in a}\alpha_i\sum_{j\in b}\alpha_j-\sum_{i\in a}\beta_i\sum_{j\in b}\beta_j\right)$$
$$<\operatorname{var}\eta\left(\sum_{i\in a}\delta_i\sum_{j\in b}\delta_j+\sum_{i\in a}\gamma_i\sum_{j\in b}\gamma_j-\sum_{i\in A}\delta_i\sum_{j\in B}\delta_j-\sum_{i\in A}\gamma_i\sum_{j\in B}\gamma_j\right)$$

Appendix C: Country and Global Sector Raw Dispersions

Figure A: EMU Country Index Return Dispersions

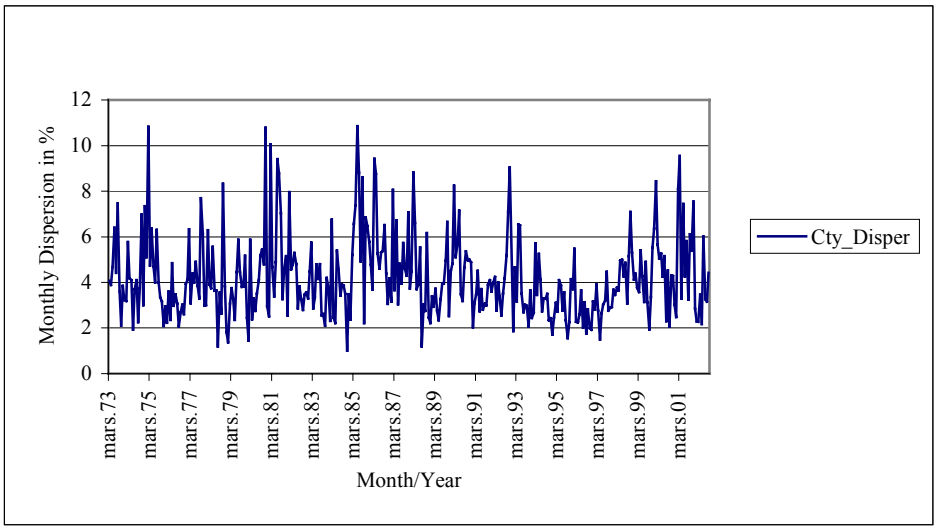
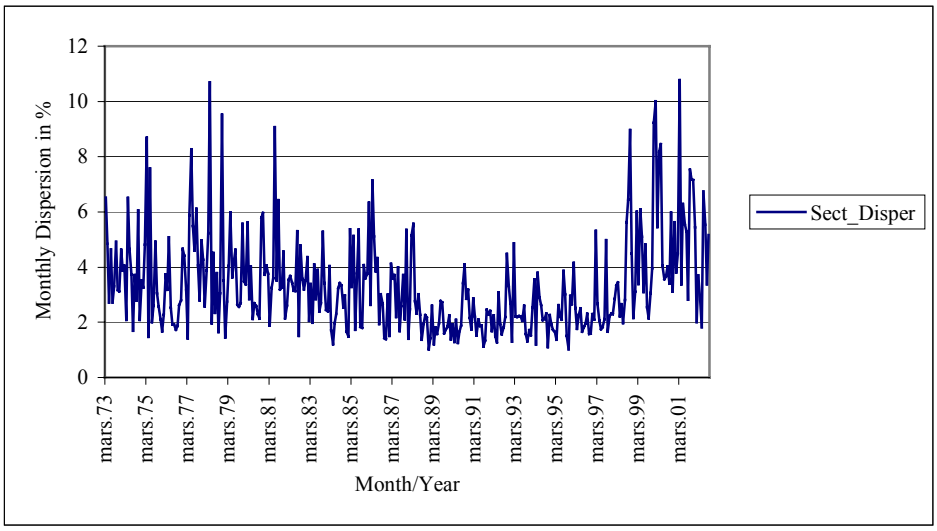


Figure B: Global 10 EMU Sector Return Dispersions



Appendix D: Mean Reverting property of country-sector indices correlation

Here we show the correlations for three groups of country- sector indices. Figure C shows the correlations for the 500 country-sector pairs with the lowest correlations in the pre-convergence period. For this panel, the correlations during the convergence period have increased notably. Figure D focuses on the middle 500 country-sector pairs (thus, with middle pre-convergence correlations) and shows that the convergence period correlations have gone in either direction. Finally, Figure E is concerned with the 500 country-sector pairs with the highest correlations pre-convergence, and reveals that post-convergence

correlations have decreased there. The conclusion is clear: at this level of observation the main regularity appears to be a tendency for bilateral correlations to revert toward the mean

Figure C: Country Sector Correlations: pre convergence vs convergence periods

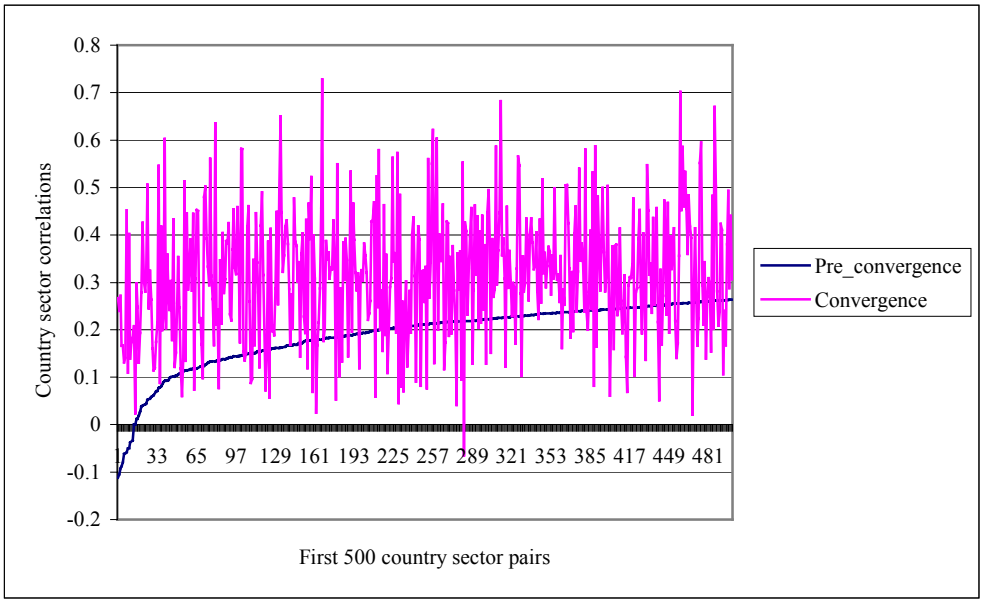


Figure D: Country Sector Correlations: pre convergence vs convergence periods

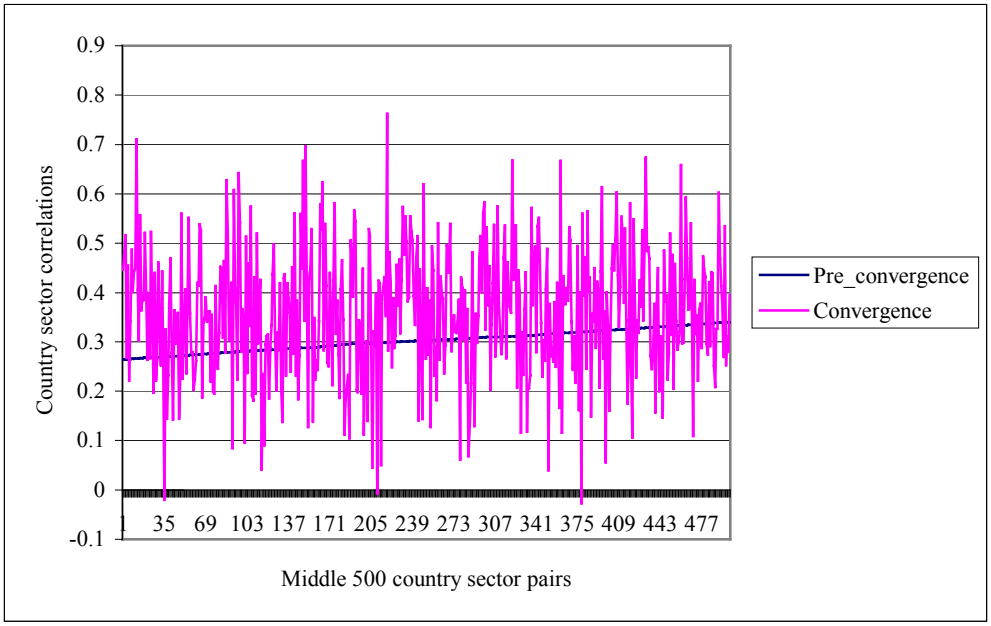
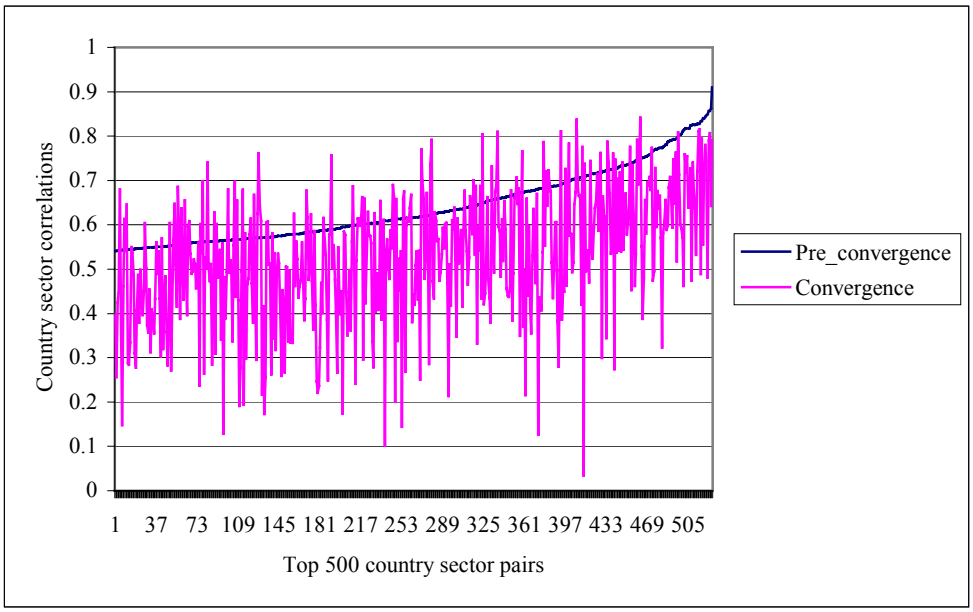


Figure E: Country Sector Correlations: Pre convergence vs convergence periods



Appendix E: Implied portfolio weights in the mean-variance optimization

Implied Country Weights

	MV Portfolio	Tangent Portfolio
AUS	0.31	-0.49
BEL	-0.36	0.31
FIN	0.26	-0.53
FRA	0.15	-0.23
GER	0.50	0.62
IRE	-0.03	-0.21
ITA	0.18	-0.15
NET	-0.13	1.16
POR	0.02	-0.28
SPA	0.10	0.80
TOTAL	1.00	1.00

Implied Sector Weights

	MV Portfolio	Tangent Portfolio
BASIC	0.06	-0.66
CYCG	-0.33	-0.67
CYSE	0.60	-0.10
GENI	-0.04	0.17
ITECH	-0.28	-0.45
NCYC	0.39	0.02
NCYS	0.14	0.30
RESOR	0.00	0.77
TOTLF	0.18	1.10
UTILS	0.29	0.52
TOTAL	1.00	1.00