Discussion of

G. Hardouvelis, D. Malliaropulos, and R. Priestley's

The Impact of Globalization on the Equity Cost of Capital

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Discussion by

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1 Introduction

This is an inspiring and stimulating paper. It discusses the impact of the introduction of the third phase of EMU on the integration of European stock market and the consequences hereof on the cost of raising capital for European firms based on the following idea: If there were investment barriers and restrictions on currency compositions of institutional investors within Europe before the introduction of the third phase of EMU, these different restrictions were known to be removed as a consequence of EMU in those countries that actually would join EMU. Consequently, if the lifting of these restrictions implies that European capital markets become more integrated (and thus that capital in the individual countries will be increasingly priced in terms of the same measure of risk), investors will require lower expected returns when investing in the stock markets, the reason simply being that the diversification possibilities in an European market are better than those of a domestic market. The lower required returns imply lower cost of capital for firms, and if these lower costs of capital influence investment decisions of firms (it becomes increasingly cheaper for firms to raise capital to invest), the integration of the stock markets will ultimately influence growth in the economy.

To investigate these issues, a problem must be solved, though. The "problem" is that the degree of capital market integration cannot be observed *per se*, i.e. it needs to be estimated. To accomplish this task, Hardouvelis, Malliaropulos, and Priestley (HMP) propose a novel way of estimating the degree of *European* capital market integration. Having done so, HMP proceed to evaluate whether (*i*) European stock markets have indeed become more integrated throughout the 1990s, whether (*ii*) such possible integration has had an impact on the cost of capital, and finally whether (*iii*) there has been a convergence of the cost of capital across countries and/or across sectors. Briefly, the findings of the papers are that there has been a significant reduction in the cost of capital, especially in the late 1990s, and a convergence in the cost of capital across countries but less across sectors. Below, I will discuss these issues.

2 Estimating the degree of capital market integration

The literature on the consequences of capital market integration is huge, but still expanding at a breathtaking pace. There is a literature on the dating of capital market integration (Bekaert & Harvey, 1995 and Bekaert *et al.*, 2002), on the effects of capital market liberalizations/integration on returns and dividend yields (Bekaert & Harvey, 2000, and Henry, 2000 to mention just two), on volatility of returns (Bekaert & Harvey, 1997), and, recently, Bekaert *et al.* (2001) have in an interesting paper illuminated how the opening up of capital markets lead to a one percent increase in annual real

economic growth over a five-year period, also after controlling for other factors that affect growth.[1]

As HMP argue, the "traditional" way of measuring effects of capital market integration is to consider an event-like methodology, i.e. identifying a date in time where a capital market liberalization takes place, and then analyze the consequences thereof. The "problem" with such an approach, HMP suggest, is that liberalization is actually not an "event", but rather a process that evolves over (longer periods of) time. In order to take this feature into account, HMP present a new way to look at *European* capital market integration.[2] Especially, HMP suggest to measure the required returns on the asset of a sector in a segmented capital market i at time point t as

$$r_{i,t} = \theta_{i,t-1}\left(\beta_i^{EU} r_t^{EU}\right) + \left(1 - \theta_{i,t-1}\right)\left(\beta_i^{L} r_t^{L}\right) + e_{i,t} \tag{1}$$

where $\theta_{i,t-1}$ is the time-varying measure of integration of capital market i into the EU capital market, β_i^{EU} (respectively β_i^{L}) is the beta of the particular sector in country i with respect to the EU (respectively local) capital market, and r_t^{EU} (respectively r_t^{L}) is the return on the EU (respectively local) capital market. The specification in (1) captures the idea that the more country i is integrated into the EU market, the more are the assets of country i priced on the basis of their exposure to global (or rather EU market wide) risk. The novel feature of this paper is the way θ is measured. Especially, θ is parameterized in the following way

$$\theta_{i,t-1} = \gamma_{0,i} + \exp\left(-\gamma_{1,i}\left|s_{i,t-1}\right|\right) \tag{2}$$

with $s_{i,t-1}$ as the period $t-1$ forward interest rate differential between country i and Germany. The idea of using $s_{i,t-1}$ to measure the degree of capital market integration is intuitive: after the introduction of a common currency, interest rate differentials between EMU member countries are believed to be eliminated, or at lest significantly reduced. Consequently, a high *forward* interest rate differential between country i and Germany *before* January 1, 1999 implies that markets believe that it is less likely that country i will join EMU, and the lower will θ be. Alternatively, the higher the probability that a country will join EMU, the lower should its forward differential be, i.e. the higher will θ be and the more will the assets in country i be priced in terms of their global (EU) betas. The underlying hypothesis is thus the following: the higher is the probability that a country i joins, the higher is the probability that any remaining

[1] Bekaert (2000) gives a brief survey of the literature.

[2] The development and elaboration upon the way of extracting the degrees of European capital market integration in HMP is on Hardouvelis *et al.* (2000); a companion paper to the present one. Another recent paper that uses a time-varying measure of capital market integration (to study issues related to the integration of emerging capital markets, though) is De Roon & de Jong (2001).

capital market restrictions are lifted, and consequently the more should the assets of country i be priced in terms of their global (EU) betas[3] - and the probability of joining is then measured by the forward interest rate differential.

With respect to the measurement of the integration of a particular EU country into the EU capital market, this measure is indeed novel. It seems reasonable, however, to make a few comments: First of all, it is important to keep in mind that as reasonable the measure is when looking at EMU stock market integration, as little has the measure to say about integration of capital markets in general, i.e. one cannot use this measure to look for integration of e.g. emerging capital markets into the world market. The reason for this is simple: in order for the procedure to work, one must know when interest rate differential are reduced. With respect to EMU, the date in time where this occurs is very well-defined - January 1, 1999 - but with respect to other countries, we do in general not have such information. Generally, a difference between the interest rates of two countries can of course exist due to for instance uncertain future exchange rate movements even when capital markets are perfectly integrated, i.e. a forward interest rate spread can exist even among perfectly integrated capital markets. The point HMP make is of course that when dealing with EMU, the date in time where exchange rate uncertainty was eliminated was indeed very well determined.

More important, however, the particular way of measuring stock market integration has some strong implication as to *when* EMU stock market integration took place. As an illustration, Figure 1 of this discussion plots the Italian/German forward interest rate spread during the sample period HMP investigate.[4] Two aspects are worth mentioning. First; there are patterns in the forward interest rate spread, and thus in the measure of the degree of stock market integration, that are hard to reconcile with the functioning of the European stock markets. For instance, it is not entirely clear why there should be a decrease in the degree of the integration of the Italian stock market into the EU market in end-1992 and end-1994 (notice that when $\gamma_{0,i}$ and $\gamma_{1,i}$ are constant parameters, the variation over time in the degree of integration arises solely from the variation over time of the interest rate spread).[5] Second, Figure 1 shows that the forward interest rate spread in end-1995 was at the same level as in mid-1991, and that it dropped to basically zero within the two-year period from end-1995 to end-1997. This implies that

[3]Especially, when asset prices are forward looking, they should, also at points in time before January 1, 1999, take into account what will happen after January 1, 1999.

[4]The series in the figure is calculated following the description in HMP, i.e. the figure shows the eight-year forward interest rate spread in two years time, with the interest rates being the swap rates taken from Datastream.

[5]The increase in the forward interest rate differential in end-1992 is most likely due to the turmoils in the ERM at that time, and the question thus is why this turmoil on the *currency* markets should imply that *stock* markets are less integrated.

the integration of the Italian stock market into the EU market, and thus the decrease in the cost of capital, occurred within a period of 18 to 24 months. Is that reasonable? Perhaps; giving the results on equity holdings of institutional investors, reported in Table 2 in HMP, home bias has been reduced for investors in the EMU countries within a rather short period. On the other hand, in order to buy the results of the strong integration in the 1995 to 1997 period, one needs to accept that (by using the estimates of $\gamma_{0,i}$ and $\gamma_{1,i}$ as reported in Table 5), in end-1995 $\theta_{i,t-1}$ can be calculated to equal 0.71, whereas in end-1997 $\theta_{i,t-1}$ can be calculated to equal 1.0, i.e. the remaining 30 percentage of Italian stock market integration has occurred within this short period. Alternatively: were the restrictions in 1995 really so binding?[6]

3 Minor comments

In addition to the points raised above, a couple of more minor comments perhaps worth mentioning are the following:

- Given knowledge of HMP's earlier research, one may wonder why the estimates of β_i^{EU} and β_i^L are restricted to be constant over time. Especially, HMP have in their previous paper, Hardouvelis *et al.* (2000), emphasized that the betas are time varying, and, actually, there is also an "economic" reason for expecting this to be the case. The interpretation of a beta is that it is given by the regression coefficient of the return of a sector in country i on the market portfolio, this being either the local or the EU portfolio. Therefore, if the country is becoming increasingly integrated into EU, it seems reasonable to expect that the covariance between the return in country i and the EU portfolio increases and the covariance between the return in country i and the local portfolio decreases, i.e. that β^{EU} increases over time and that β^L decreases over time.

- Concerning the tests for convergence of equity premiums across sectors or countries, HMP make novel use of the kind of tests for convergence developed in the macroeconomic growth literature, and find that there has been a convergence of equity premiums across countries (but less across sectors). What is still somewhat up to the reader to interpret, though, is whether this equity premium convergence is related to any real convergence within the EU, i.e. issues related to the question of *what* has caused the convergence of equity premiums? One possible way to shed light on such questions could be to run some simple regressions of the

[6]Notice that Italy is no special case. The decreases in the equity premiums in the different sectors of the different countries are form Figure 1 in HMP seen to occur in the period 1995 to 1997 as well (in those sectors where a decrease is visible).

dispersion of the equity premiums across countries on cross-country dispersion of e.g. inflation, industrial growth and so forth. Doing so, it would be possible to relate the reduced dispersion of equity premiums across countries to possibly reduced dispersion of growth in the different real economies, for instance.

- Finally, it could be interesting to try to link HMP's findings of strong cross-country convergence of equity premiums to the results of e.g. Rouwenhorst (1999) who argues that "there is no evidence that the differences between countries have disappeared" in his investigation of diversification possibilities in the European capital markets.

4 Conclusion

To summarize: this paper is indeed an interesting paper. It provides evidence on very significant reductions in the cost of capital for firms in the EU and shows that there has been a reduction in the dispersion of the equity premiums across EU-countries. In order to provide this evidence, the paper uses an innovative procedure to filter out the degrees of integration of different EU countries into the EU capital market. A question that possibly remains after reading the paper is exactly *why* there has been such a strong reduction in the cost of capital within such a *short* period of time.

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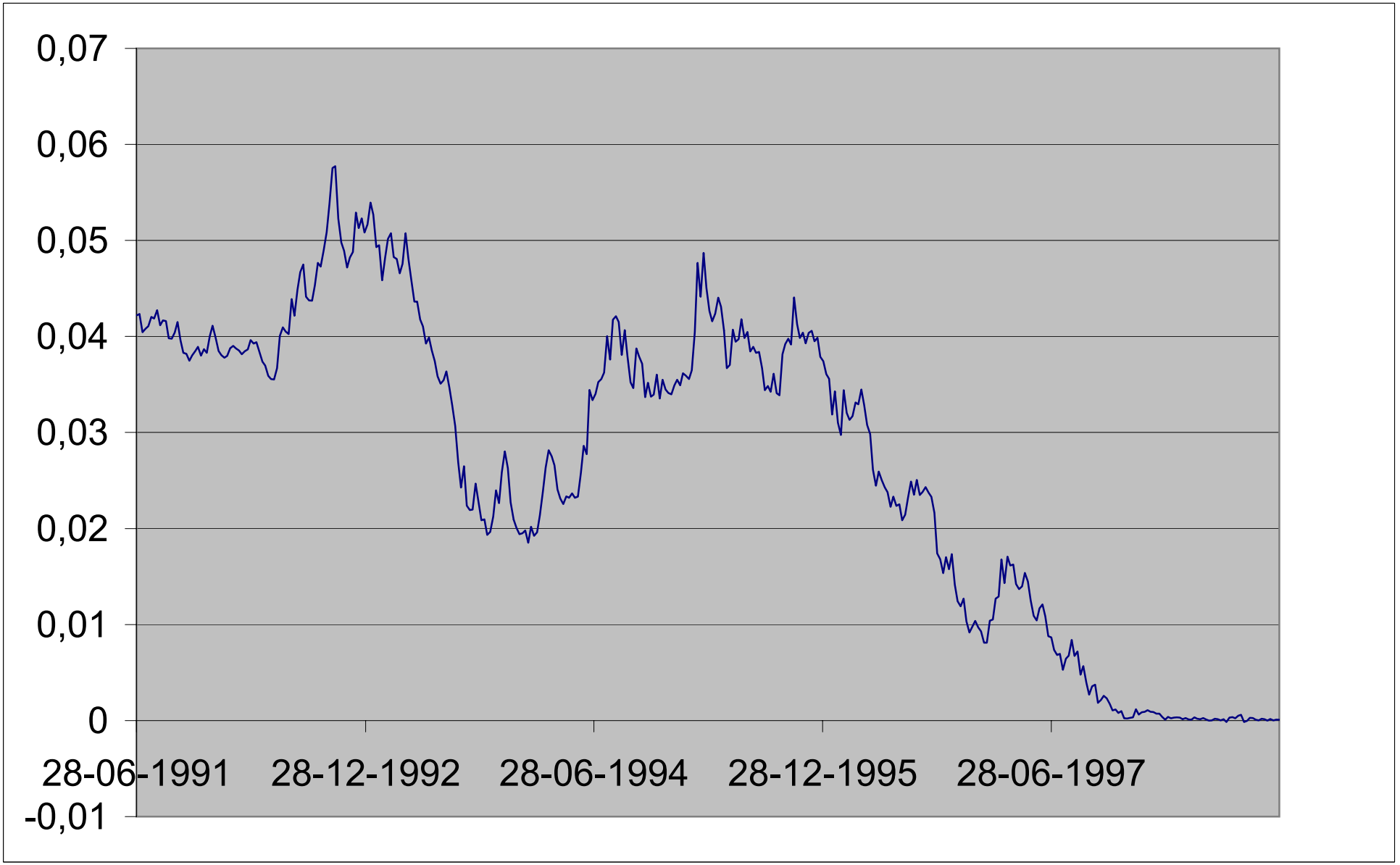
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