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Statement in consultation process on Basel II; Advance Version of EIIW Paper No. 103
Sent to
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Risk Pricing, Investment and Prudential Supervision: A Critical Evaluation of Basel II Rules

July 11, 2003
main points are identical to the testimony of the author at Workshop of the European Parliament: Basel II and Consequences for SMEs, Brussels, July 10, 2003; see also the powerpoint presentation under wwww.euroeiiw.de and the website of the EP

1. Introduction

Basel II rules aim at contributing to financial market stability worldwide. The new set of rules is supposed to particularly encourage a more careful and explicit evaluation of credit risk. Hence a stronger spread of interest rates is to be expected, and this will give a useful signal to the extent that excessive credit risks are avoided. However, due to well-known problems in credit markets one cannot easily rule out that Basel II will go along with a rise of interest rates in general and adverse selection problems (more risky projects will be suggested by investors). A major progress could result from Basel II indirectly, namely by encouraging firms to calculate risks in investment and innovation projects more carefully. Several problems, however, have remained unresolved.

One major problem with respect to adequate risk pricing comes from "stubborn exchange rate" fixing which is found in many Asian countries, even those which officially have flexible exchange rates. Governments fix a rigid nominal parity to the dollar in order to benefit from low real interest rates and the associated high investment output ratio and growth, respectively. Such exchange rate fixing creates not only artificially favourable investment conditions – in the sense that there will hardly be an explicit country risk premium as long as the (de facto) peg is credible – and also encourages the well-known problem of foreign exchange balance sheet mismatch, namely that investment projects generating domestic currency revenues are financed through loans in foreign exchange; the exchange rate exposure is mostly unhedged, which can be considered as either a risky business of the bank or of the bank's client. Basel II has not addressed this problem in any way but leaves the whole set of problems which become quite obvious in the Asian crisis to governments and national regulators in Asian countries which, however, have not really addressed the problems. The IMF also has been rather silent with respect to this problem. The rigid fixing of many Asian currencies also has the consequence that major bilateral US imbalances in the current account cannot be remedied by a nominal and real exchange rate appreciation of major surplus countries (with China being the most important case). With a rising bilateral US current account deficit vis-à-vis Asia there will be increasing pressure for a strong real appreciation of the Euro so that that a transatlantic US surplus position could offset the increasing transpacific US deficit position. This problem, however, implies a relatively strong or relatively long period of Euro appreciation. Rigid fixing of nominal exchange rates in Asia thus causes excessive exchange rate volatility in Europe and a relatively strong real appreciation of the Euro which will go along with increased net capital inflows from the US. Such inflows in the Euro zone could contribute to a steeper yield curve than otherwise; such an impact on the yield curve comes if EU capital inflows from the US are mainly short-term inflows. We will not look into this special problem – and country risk – in the following analysis but will rather focus on other issues.

The main focus of the new rules concerns the pricing of risk; banks must evaluate risks more explicitly while greater risks go along with high equity capital requirements for the respective banks. Basel II proposals have, however, some doubtful elements. At first we take a brief look at some basics of banking and financial markets before we present criticism. In the appendix we present a new theoretical approach for why the yield curve can be assumed to be a predictor of business cycle developments.

Financing investment and innovation projects of firms is a risky business which involves special problems, above all problems of asymmetric information. The investor is typically better informed about the project risks than those financing the project – say private or public banks. Banks give loans easily if there is adequate collateral; however in modern OECD countries' service economies, only the minority of industrial investors can easily offer collateral. Firms from sectors which are knowledge intensive or technology intensive often

have the problem that intellectual property rights are imperfect and technology markets are very imperfect. This clearly creates problems for such firms to come up with collateral.

Banks will easily give loans if the equity-credit ratio of the respective firm is high, but this ratio is relatively high only in the US. Start-up firms in knowledge and technology-intensive sectors face additional problems as long as they have not entered a stage of sustained profitability since investors in capital markets and bankers will find it quite difficult to anticipate future profit records. Therefore for firms in the start-up stage and young firms in the expansion stage, adequate pricing in stock markets is all the more important: Rising stock market prices will facilitate new equity capital which in turn will make it easier to obtain loans with favourable conditions. From this perspective, undistorted prices in stock markets is crucial for investment financing, innovation and growth. Stock market bubbles – implying often negative costs of capital and hence overinvestment (allocative inefficiencies) – as well as stock market crashs will particularly undermine the expansion of young knowledge intensive and technology intensive firms.

Against this background, the doubtful recommendations of fraudulent analysts in US investment banks – in contrast to internal memos, these analysts recommended the purchase of particular internet and telecommunications firms in order to stimulate M&A business of the investment bank – raise important critical questions for prudential supervision. The whole set of problems related to such dirty tricks in investment banks has not been addressed in Basel II, although this field represents a significant international challenge: Distorted signals from US investment banks and the US stock market will affect almost all capital markets worldwide – that is, create distortions and external effects – since the US stock market is dominant and since US investment bankers have a global signalling function.

As regards banks, there also is the problem of asymmetric information as depositors have little information about the bank's lending policy while bank managers normally are aware of the risks faced in various banking activities. Since failure of a major bank can lead to dangerous domino effects, including bank runs and a major confidence crisis leading to economic crisis, prudential supervision has been applied for decades in many market economies. Capital adequacy requirements and disclosure rules are among the main instruments applied in prudential supervision. However, there is a general caveat against excessive prudential supervision: Since competition is the natural benchmark of a market economy, excessive or inadequate (distorting) interference should be avoided.

Loan markets are rather imperfect markets since there are information asymmetries and potentially perverse effects. The latter include adverse selection problems which imply that in periods of high interest rates, investors will seek to finance a relatively larger share of high risk projects. Main financial markets (being interdependent among each other) are:

- deposit markets
- loan markets
- bonds markets
- stock markets
- life insurance markets (and other insurance markets)

Since banks are often involved in the insurance business and insurance companies are involved in the banking business, major problems in banking can negatively affect insurance markets and vice versa. As both banks and the insurance companies hold stocks in their respective portfolios, both types of companies are affected by price changes in the stock market.

In open economies, major risks in the banking business and in financial markets, respectively, are related to demand shocks, supply shocks – including technology shocks – and economic policy shocks. From a banker's perspective one has to distinguish between country risk, credit risk (related to the respective investment project) and operational risk (related to the technical operation of the respective bank). Big banks finance projects of big firms and also

SMEs in agglomeration areas; small projects in towns and in rural areas are typically financed by relatively small banks (which often are local banks), including savings banks and cooperatives.

Due to financial market deregulation in OECD countries and capital account liberalization in many countries worldwide in the 1980s and 1990s, there is an increasing cross-border flow of finances which could stimulate long-term growth in the world economy. However, financial links also create a channel for the transmission of volatility and disturbances.

Against this background Basel II has been proposed by the Bank of International Settlements: An improved set of rules which are largely related to risk management and capital adequacy. As regards risks of projects of firms, interest rate spreads should reflect the respective ex-ante risk. Residual ex-post risk has to be covered by equity capital so that unexpected shocks will not lead to bank failures and systemic instability. Basel II mainly requires that banks classify their activities in accordance with five different categories, each of which is associated with different risk assessments. Small loans (below 1 million Euro), which are typical for SME financing, are in most cases assigned to retail activities and thus have relatively low capital adequacy requirements. As regards credit risks, banks can rely on internal rating or even advanced approaches of risk modelling where the latter goes along with reduced capital adequacy. The broader risk analysis required by Basel II rules will bring about more individually-tailored risk spreads for creditors so that part of SMEs will face higher interest rates and costs of capital. Some firms, however, should benefit from reduced risk premiums under Basel II.

Main questions which have to be raised with respect to Basel II are:

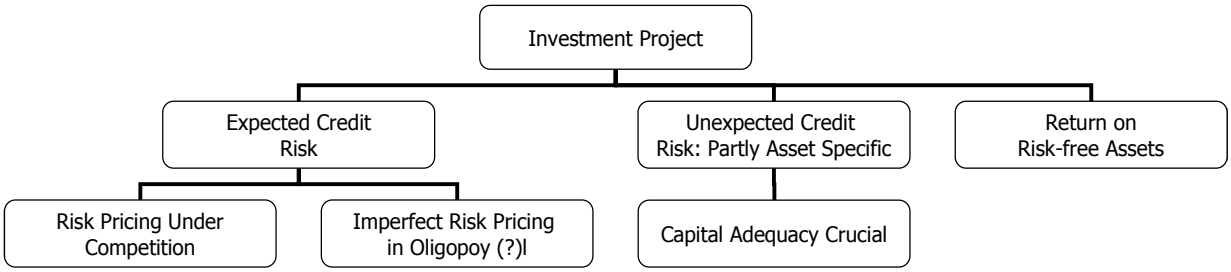
- Do the rules impair the role of SMEs, which are traditionally considered important for employment, growth and innovation?
- Are the rules comprehensive enough to reflect modern financial markets and banking?
- Are the new rules consistent?
- Are the rules efficiency-enhancing in the sense that external costs and benefits of firms' investment decisions are fully considered?
- Which complementary measures on the part of national government(s) are adequate to promote growth and stability?

The following analysis looks into some of these key points briefly**.**

2. Basel II Rules and SME Financing

From a theoretical perspective, risk spreads should reflect anticipated risks while capital adequacy rules are needed to cover unanticipated risks (see Fig. 1). In this respect, Basel II is somewhat confusing. Basel II wants to encourage interest rate spreads, but it is clear that the degree of competition in the respective field and the stage of the business cycle – as well as impact of net capital inflows (rising in the Eurozone in periods of a dollar depreciation) – will influence the degree to which such spreads can be realized in loan markets.

Fig. 1: Main Aspects of Credit Risk



There is a paradox in Basel II, namely that the call for increased spreads will be procyclical (see also appendix). At the same time, it is clear that in periods of recessions when there is an excess supply in loan market credit spreads, this will be rather difficult to realize. This would clearly call for a cyclical component in capital adequacy rules, namely that banks being unable to get normal credit spreads in periods of recession must realize higher minimum equity capital ratios in these times.

Small and medium enterprises (SME) are important for employment, growth and innovation in all countries; this holds for EU-15 and even more so for the EU accession countries from eastern Europe. While large firms enjoy access to stock markets and to the corporate bond markets SMEs – in particular in Europe –, they largely depend on bank loans. SMEs can be classified into at least three different categories:

- start-up companies and young firms that typically face a high bankruptcy risk;
- established SMEs in the nontradables sector which by its very nature is associated with a regional or local market and limited international competition – the latter, however, is not excluded if foreign direct investment is unrestricted;
- established SMEs in the tradables sector which face competition from world markets

Basel II does not draw this distinction, and indeed there is not explicit focus on SMEs. However, there is an implicit reference in the context of small loans as well as granulation. For small loans, banks can apply a soft clause which results in low capital adequacy requirements. However, the general granulation clause is doubtful since young firms and start-up companies obviously represent a risk which is higher than in the case of small established firms. Start-up companies and young firms which represent higher credit risks *ex ante* should face relatively high interest rates from a banker's perspective; government might, however, argue that start-ups are adding to competition and innovation so that there are positive external effects – those indeed would justify subsidization of loans by government (depending on the size of expected external effects, effective capital costs of some start-ups could then be even lower than for a standard firm).

Internal rating in small banks giving loans is assumed to be the standard case in the future. From this perspective, SMEs with relatively risky investment projects will face higher spreads under Basel II, provided local and regional competition is strong enough to bring about such spreads.

One may argue, however, that bank loans going to firms doing local business – in the nontradables sector –should generally face reduced risk weights for these activities. Granulation rules or absolute limits on loans or the size of the firm should not play a role here.

By contrast, loans going to newly created or young firms should face a higher risk weight. The fact that one has to distinguish between new firms and established companies is obscured by the general granulation rule: Local banks which often are state-owned in several EU countries could come under political pressure not to apply adequate rating procedures for new companies as local government is interested in promoting expansion of local business. For example, the Savings Banks in Germany, owned by local government, has a market share slightly over 50% in the financing of start-up companies in the expansion stage

To the extent that governments are afraid that increased interest rate spreads will undermine the creation of new firms it would be adequate to give banks a special tax bonus for profits realized in the field of venture capital financing, broadly defined. Alternatively, government could give an interest rate subsidy to the entrepreneurs creating a new firm where the subsidy should reflect positive external effects (most likely in the field of technology-intensive start-ups with anticipated technology spillovers; with the start-up being the recipient or the source of such spillovers). Government authorities facing tight budget constraints – not least in the context of the Growth and Stability Pact in the Euro zone – are unlikely to come up with explicit loan subsidies for start-up companies. Failure to provide explicit loan subsidies will undermine incentives for big banks to become more active in start-up financing. A major problem in the context of Basel II is that the call for more explicit risk pricing – partly associated with higher costs of bank operation – will encourage big banks to further pull out of non-agglomeration regions so that competition in many regions will be weakened in EU-25.

This retrenchment of big banks is partly caused by pressure from Euro capital markets to earn competitive rates of return, and as big banks anticipate that adequate spreads in local markets – with high sunk costs for banks – cannot be achieved, the big banks will concentrate their business on agglomerations and rather big clients which will allow them to spread fixed costs more easily. This retrenchment is an important indirect effect of the envisaged Basel II rules. Local savings banks and cooperative banks will enjoy less competition, but it is unclear how this will affect efficiency with regard to the allocation of resources. Reduced competition could allow local banks to fetch higher spreads in credit markets, but it is unclear whether Basel II will really stimulate banks to realize such differentiated risk premiums, as local banking markets are often tight oligopolies. The existence of local networks could generate pressure, leading SMEs to obtain loans at rather uniform rates. Credit rationing could play a continued role in local and regional credit markets. It is not easy to remedy this problem.

The claim of the architects of Basel II that impact studies have shown that the new rules will bring lower interest rates for SMEs is doubtful since it is based on a status quo analysis of the mix between big banks and small local banks. To the extent that Basel II will significantly change the relative regional or sectoral presence of big banks, the conclusions drawn are not valid. Moreover, changes in the yield curve associated with Basel II were not taken into account. If risk spreads are increasing one must anticipate that SMEs will increasingly finance long-term investment with relatively cheap short-term loans. Such a development, however, implies that an increasing balance sheet mismatch on the part of SMEs and increasing vulnerability for interest rate shocks.

The higher the share of equity capital in the balance sheet, the easier it will be for SMEs to get loans. Here tax rate reductions could help on the one hand, but on the other hand it is clear that EU countries have to catch-up with the US in the field of venture capital (VC) financing. This means that government cannot normally give large subsidies to VC firms, as it is the case in Germany (making VC in effect partly obsolete). VC will become increasingly important in the modern service society where new firms have very little collateral.

3. Eastern EU Enlargement and Basel II

The problem of big banks – mostly foreign-owned (e.g. Hungary, Poland) – concentrating on major clients and bank firms is that a major impediment for employment and growth in Eastern

European is accession countries. While the presence of foreign investors will certainly bring efficiency gains for the banking sector, dominance of foreign banks in some eastern EU countries has also created problems:

- some banks have established procedures under which a team of London-based specialists will decide about major loans; this could mean that specific opportunities for investment – say in the telecommunications sector – will not be realized because London-based bankers have a tendency to apply a kind of global filter to loan decisions, namely to decide on the basis of overall OECD perspectives in the respective sector whether an investment project in eastern Europe will be financed. The overcentralization of loan decisions thus not only fails to take into account local information relevant for a fair evaluation but also leads to an increasingly uniform investment pattern in various sectors across countries;
- foreign big banks are likely to impair the expansion of local banks which will often thus have low profit rates; increasing problems of firms in peripheral regions and in small towns to finance SMEs will raise unemployment rates and per capita income gaps in non-agglomeration areas of accession countries.

As a consequence, the European Community will be confronted with calls for increased structural funds going to poor regions in Eastern Europe. Governments in accession countries and the EU should take a closer look at these problems; special incentives for the expansion of local banking might be appropriate. Conditional privatisation of banks which are still state-owned should also be considered where a requirement would be that a minimum commercial presence in peripheral regions must be assured for at least one decade. The European Investment Bank and the EBRD could develop new forms of co-financing start-ups and other young companies. In some cases, a simple twinning with national SME promotion banks might help, but in many cases one might indeed organize regional tenders based on the internet and new banking technologies. For a period of five or ten years, ten regional lots of co-financing could be offered to all banks, but there could be requirements to involve at least one local bank for every loan. Such new financing schemes could be helpful in stimulating catching up both within EU accession countries and between accession countries and EU-15. Finally, such new SME co-financing schemes might also be applied to EU-15 countries, provided that the principle of competition and non-discrimination is applied.

4. Necessary Improvements and an Agenda for Basel III

Basel II is a step forward to greater financial stability, but the step is rather incomplete and some expectations on the side of the BIS are not well-founded. There is need for marginal improvements with respect to the final wording of Basel II, but there is also an obvious need for a Basel III in the future. As regards marginal improvements, we draw attention to the above discussion. Partly it will be the EU which has to come up with complementary policy innovations. The most important point for immediate improvement is that banks should face an increased minimum capital requirement in periods of recession. Banks which are active in countries or regions whose business cycles are not perfectly correlated would thus have an advantage.

As banking and the insurance business increasingly merge within EU countries, it would be adequate to have prudential supervision rules which address both banking and insurance business. Many insurance companies have large portfolios of firms which are supposed to generate long-term profits. If banking rules become relatively stricter, universal banks have an incentive to effectively shift part of their business to the less regulated insurance arm of the company. As Basel II is silent with respect to insurance companies, there is a lack of comprehensiveness of rules. Basel III must take a closer look at problems in the insurance business. Some national rules in this field are quite inadequate. The German Minister of Finance, Mr. Eichel, for example, has allowed insurance companies – without presenting any

clear arguments – to adjust balance sheets with a long time lag when stock prices fall; it is unacceptable that national governments contradict the BIS' strategy to establish more transparency in financial markets. Failure of any major insurance company in Japan, Europe or the US could dangerously undermine global financial market stability.

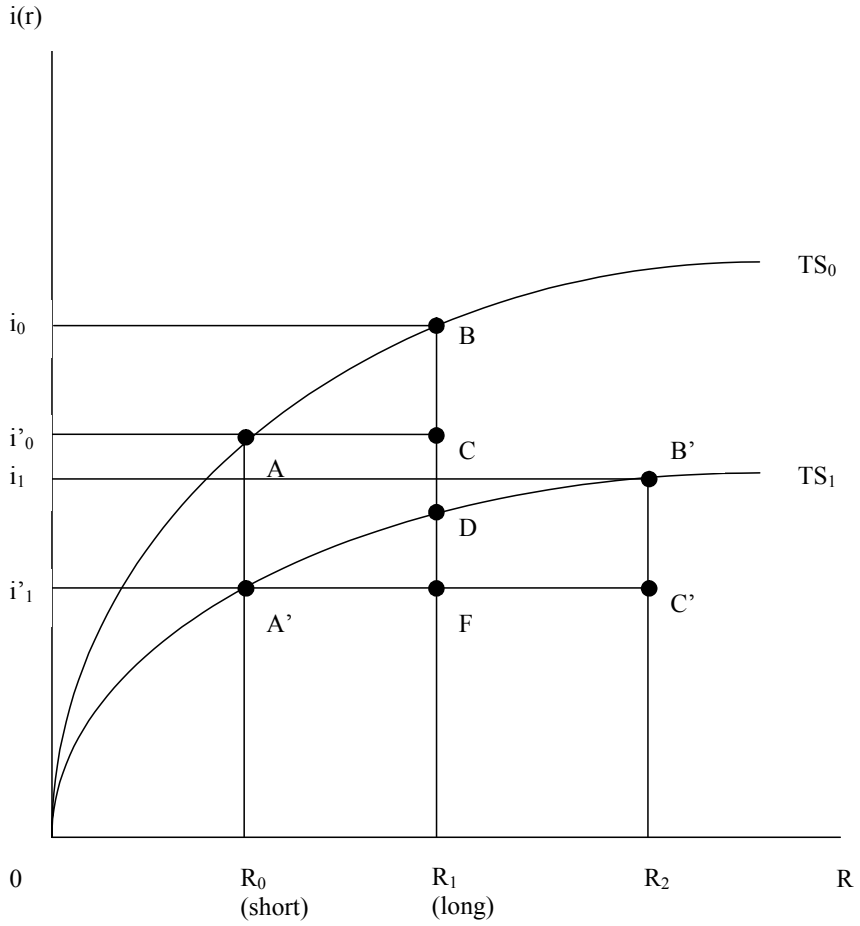
Another problem is the lack of prudential supervision in investment banking, an area in which Basel II rules also remain silent. This is all the more surprising since fraudulent investment bankers in the US have obviously contributed to an excessive stock market boom in the late 1990s during which capital costs became negative for publicly quoted companies. Negative costs of capital have caused a wave of overinvestment which has been followed by a wave of underinvestment in the years 2001-03. The associated boom & bust cycle of big firms has, of course, created major problems for the respective supplier industries which typically consist of SMEs; reduced margins of those firms in turn brought an additional *ex post* risk for banks which had given loans to these firms. Adequate equity capital of banks is assumed to help in weathering the storm, but the more obvious and more adequate answer to a stock market hype caused by fraudulent investment banks is to impose adequate regulation on investment banks so as to minimize incentives for investment bankers who give false advice. The main motive for analysts from investment banks to give false advice to investors – false in the sense that recommendations were often totally inconsistent with internal analysis – was to generate additional business for the mergers & acquisitions arm of the investment bank. If problems in investment banking cannot be addressed and remedied in Basel II, these problems must be put on the agenda for a future Basel III. Lack of supervision over investment banks is the single most important danger for future global stability.

Finally, it is obvious that the problem of rigid nominal exchange rate fixing must be addressed in the future since such fixing creates periods of tranquillity followed by periods of international financial turmoil which in turn will affect the stability of financial markets.

Appendix: The Yield Curve as a Predictor of the Business Cycle (Capacity Utilization)

Banks earn part of their profit from transforming short-term deposits into long-term loans, which are mainly needed by firms to finance long-term investment projects. In the following graph, the initial yield curve TS shows the main idea: There are short-term deposits of maturity R_0, which go along with a low interest rate paid, namely i'_0; the banks use those deposits as a basis to extend long-term loans with a high interest rate of i_1 (maturity is R_1). The interest rate spread for the bank and hence the profit rate is equal to the distance BC. With a flatter yield curve (TS_1), the same profit rate can only be realized if banks accept a larger balance sheet mismatch so that the maturity differential will rise beyond the initial ratio (R_1/R_0). In order to restore the initial profit rate the maturity differential must be raised to R_2/R_0. This brings about an increase risk for the bank with respect to interest rate shocks. It is unclear how Basel II will affect the yield curve; the first part of the curve might rotate upwards as more SMEs will favour short-term financing of investment in a situation in which risk premiums are increasing, and they will increase parallel with maturity (note: from a theoretical point of view, a true yield curve would reflect the weights of each maturity so that a three-dimensional plot would be required).

Fig. 2: Yield Curve and Profit Rate (R is maturiy, i and r stand for the nominal and real interest rate respectively)



Transformation and Profitability

From the perspective of an individual bank, one could argue that there is a positive link between the interest rate spread – a proxy for the profit rate – in sense of the difference between the short-term deposit interest rate i^S and the long-term loan interest rate i^H and expected capacity utilization ϕ^E. This spread will also depend on the steepness of the yield curve as expressed by the differential between the long-term interest rate, i, and the short-term interest rate i' (parameters a and b – with b in the interval 0,1 - are assumed to be constant):

(1) $$i^S - i^H = a\phi^E + b(i-i')$$

In the long market equilibrium, the difference between the deposit rate and long rate will be equal to the differential between the long-term interest rate and the short-term rate; indeed we will have $i^S = i$ and $i^H = i'$ so that:

(2) $$(1-b)i = a\phi^E + (1-b)i'$$

If Basel II should bring an increasing procicality, the parameter a will increase. The average long-term interest rate would therefore increase.

(3) $$i = [a/(1-b)]\ \phi^E + i'$$

From (3) we get:

(4) $$i/i' = [a/(1-b)](\phi^E/i') + 1$$

Hence we can see that the ratio of long-term interest rate to the short-term rate is positively related to the expected capacity utilization rate. As one may argue that professional forecasters will not make systematic errors with respect to capacity utilization, it holds that the yield curve is an accurate predictor of future capacity utilization.

The short-term interest rate i' can be assumed to be determined by the relative money supply M/Y (with M and Y standing for the nominal money stock and real output, respectively); we also assume that expected inflation π'^E will affect the short-term nominal interest rate so that we can rewrite equation (3) as follows (a' is assumed to be in the interval 0,1):

(5) $$i = [a/(1-b)]\phi^E + a'(Y/[M/P]) + (1-a')\ \pi'^E$$

The long-term interest rate is a positive function of the capacity utilization and a negative function of (M/P)/Y and a positive function of the expected inflation rate. As i is the sum of the expected real interest rate and expected inflation rate, the expected real interest r^E can be written as follows:

(6) $$r^E = [a/(1-b)]\phi^E + a'((Y/[M/P]) - \pi'^E) + (\pi'^E - \pi^E) = [a/(1-b)]\phi^E + a'([M/P]/Y - \pi'^E)$$

As national output Y is equal to ϕY^{pot} – with Y^{pot} representing production potential –, we can replace Y by ϕY^{pot}.

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