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## Introduction

Sovereign rating is an assessment given by rating agencies to the ability and willingness of a country to service its (foreign) debt. It is important to note that sovereign rating is mainly an assessment given regarding the relative probability that the country cannot or will not service its existing/future obligations; it is not an automatic assessment of the macroeconomic and/or political situation in the country. This assessment is given with consideration to the country as well as the enterprises operating in the country. Credit rating is also one of the most important determinants of the price of money a country (as well as its enterprises) can get from international money markets.

Estonia has ordered sovereign ratings since 1997 using the services of three rating agencies: Moody's, Fitch IBCA and Standard & Poor's. Ever since the sovereign ratings of Estonia have remained in the level of investment grade BBB+/Baa1<sup>1</sup>. This corresponds to the highest level of category BBB that is defined as, "*An insurer has adequate capacity to meet its financial commitments. However, adverse economic conditions or changing circumstances are more likely to lead to a weakened capacity of the insurer to meet its financial commitments*" (Standard & Poor's web-page). The Fitch was the first rating agency to upgrade Estonian sovereign rating to A-level in the end of August 2001.

This research gives an overview of the nature of ratings, the issues related to sovereign ratings and provides an analysis of the factors affecting Estonian ratings and their importance. The aim of the present research paper is to find out the most important factors that allow/constrain the possible future change in Estonian rating.

The paper is divided into three chapters. The first chapter gives an overview of different rating agencies and the methodology they use in rating. Besides that, the interpretation, comparability and explanatory power of different ratings are analysed. The chapter concludes with the description of Estonian rating history.

The second chapter analyses the possible determinants of Estonian rating. Firstly, possible problems in analysing the determinants are discussed. Secondly, the factors that have been important determinants of ratings in theoretical literature or previous empirical researches are presented.

The third chapter analyses empirically the determinants of Estonian credit rating. For this purpose, Estonia is analysed in the context of three country groups: former socialist countries, developed European countries and countries having similar ratings. Also the factors different rating agencies have pointed out in their reports about Estonia are compared with the empirical results. The chapter concludes with the comparison of the results of the analysis and SWOT analysis.

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<sup>1</sup> Fitch IBCA gave initially a rating which was one level lower than ratings by other rating agencies, then upgraded the rating to level BBB+ in 2000, gave a positive outlook in summer 2001 and upgraded the rating to A in August 2001.

# 1. Ratings, Rating Agencies, Methodology and Estonian Rating History

## 1.1. Rating Agencies and Their Products

The role of a rating agency is to mediate between creditors and credit recipients in order to minimise the problems that may arise in connection with the information asymmetry.

Ratings are issued concerning individual enterprises and companies of real economy and finance sector, where the financial situation of an enterprise (company, bank, etc) as the issuer (or potential issuer) is taken into consideration. In addition to that, ratings are provided for concrete financial products (bonds, bank loans, etc) in which case the terms and conditions of those products (eg existence and type of security, the status of the instrument in bankruptcy proceedings if the issuer goes bankrupt, etc) are considered in addition to the financial situation of the issuer.

Ratings are very common: more than 95% of bond issues in recent years have had at least one rating; ratings have been called “the oil of the markets” which guarantee their smooth operation. The development of rating agencies and their products has speeded up during the last two years: the establishment of euro and the convergence of the European bond market being the catalyst there and; as a result of that, the need for the rating of bond issues nominated in euros has increased considerably (The Economist, 1999b).

Foreign debt rating is an important indicator since the activities of several investors are limited by the rating of the financial instrument, whereas the restrictions can be absolute or relative in nature: for instance, the internal rules of many investment funds and banks prescribe that money can only be invested in financial instruments which have been assigned an investment grade rating by the major rating agencies, in other cases the restrictions are less severe and more risky investments are allowed; though, there is usually a fixed amount of resources that can only be kept in the instruments of a certain rating category.

Another type of ratings is provided to countries (sovereign rating), usually those function also as the highest possible rating of economic units operating in the territory of the country and of the instruments issued by such economic units; this rule is generally accepted by all rating agencies and exceptions are few<sup>2</sup>. The reason for that is that in crisis situation the government may establish control over currency and

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<sup>2</sup> This approach is, however, evolving: in June 2001 the rating agency Moody's announced its revised country ceiling policy that will allow to upgrade several issuers over the sovereign rating. Rationale for this is based on the recent experience with government behaviour in crisis situation – particularly in Ecuador, Pakistan, Russia and Ukraine. These cases have shown that governments in default may choose to allow foreign currency payments on some favoured classes of obligors or obligations.

capital account transactions or otherwise limit the possibilities of economic agents in servicing their foreign debts.

The change of a country's rating has a direct effect on the economy: the analysis conducted in the International Monetary Fund (IMF 2000) showed that the upgrading or downgrading of the sovereign rating affects the size and direction of capital flows. The analysis considered the changes in sovereign ratings of emerging markets during the last 10 years (the rating by Moody's and Standard & Poor's was upgraded in 61 cases and downgraded in 95 cases). The conclusion made from the analysis was that the volume of bonds issued by economic agents within a year following the upgrade of the rating increased by 17% on the average and decreased by 25% during the year following the downgrade. The change in the rating did not only affect the behaviour of the bond market, but also affected the bank loans and the stock market where the lowering of the rating similarly had a larger effect<sup>3</sup>.

The number of rating agencies in the world is estimated at 150, though the number of major rating agencies ranges around 10, the largest and major global agencies (ie agencies operating in various countries in the world) being the following:

- **Moody's Investor's Service** – ca 1500 employees, the number of ratings assigned exceeds 9000 (107 countries)
- **Standard & Poor's** – ca 1000 analysts, the number of ratings assigned exceeds 6000 (81 countries)
- June 1, 2000 two major rating agencies merged – Duff & Phelps Credit Rating Co and Fitch IBCA, as a result of which the agency called **Fitch** emerged – more than 1100 employees, ca 6000 ratings assigned (52 countries, also the ratings of municipal bonds), has 40 representations all over the world (BIS, 2000, pp 21-24, 33)

In addition to global rating agencies, there are also agencies, which operate in the regional or national level. This research paper looks into the ratings mainly given by three major rating agencies; all those rating agencies have assigned a rating to Estonia, as well.

## 1.2. Problems in Determining Ratings (of Transition Countries)

There are several basic problems in connection with the sovereign ratings of transition and developing countries. Firstly, emerging markets have been assigned ratings only within the last ten years (e.g. the number of ratings of emerging markets by Moody's increased from 12 in 1993 to 64 in 1999) and, therefore, the methodologies are not yet as established as in the case of industrial countries. (Monfort and Mulder, 2000, Appendix 1).

Secondly, according to the definition, a sovereign rating must not only show the country's ability to service the debt in accordance with the original terms and conditions but also its willingness to do so. This aspect can be seen in the definitions

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<sup>3</sup> The authors also note that it was difficult to draw a clear line in the analysis as to what extent the changes were brought along by the change in the rating only and to what extent by the changing economic situation which in its turn caused the sovereign rating to change (IMF 2000, p 59).

of ratings of both major agencies (Moody's and Standard & Poor's), whereas the definition of Moody's points out rather clearly the possibility of establishing control over the currency and/or capital transactions: "[sovereign credit ratings] are an assessment of each government's capacity and willingness to repay debt according to its terms" (Standard and Poor's web page); "[sovereign rating is] a measure of the ability and willingness of the country's central bank to make available foreign currency to service debt, including that of the central government itself" (Moody's web page). The political will is the aspect of the sovereign rating which has remained problematic ever since.

Thirdly, another important aspect is the fact that an undetermined variable of no empirical data needs to be assessed here: until recent years, governments did not default on sovereign foreign currency bonds. Recent experiences with sovereign bond restructuring (particularly by Ukraine and Pakistan) has invalidated the immunity of sovereign bonds from restructuring, nevertheless the experience is still limited. Other examples from recent times (Russia and Indonesia) do not render itself useful, as financial instruments concerned were not foreign currency nominated sovereign bonds.

### **1.3. The Interpretation, Comparability and Explanatory Power of Sovereign Ratings**

The idea of a rating is to point out the probability of the issuer not being able to service its debt in a timely manner and in accordance with the conditions agreed in advance, or in other words the probability of the issuer failing to service the debt (*probability of default*). Moody's is the only major rating agency that includes in its long-term rating the measurement of the part of debt that is likely to be recovered after the failure to service the debt (*expected loss*)<sup>4</sup> (Moody's web-page).

The probabilities mentioned are not absolute in nature (cannot be calculated with purely mathematical methods), but rather relative. Another important aspect of ratings is the fact that the main ratings used (by Moody's, Standard & Poor's, Fitch) try to reflect the situation with reference to the phase of the economic cycle as opposed to at a concrete moment, the length of an economic cycle being generally 3 to 5 years (BIS 2000, pp 23, 30, information by rating agencies).

In addition to a combination of letters and/or numbers for a rating, many rating agencies also use the notion of outlook or watch, which can be stable, negative or positive; the practice of determining the outlook tends to differ among different rating agencies: in the case of Moody's and Fitch, the adding of an outlook means that the rating can change or will be confirmed in the near future; Standard & Poor's uses the notion of outlook also for longer periods.

Some ratings bear an indication "pi" which shows that the ratings are based only on public information.

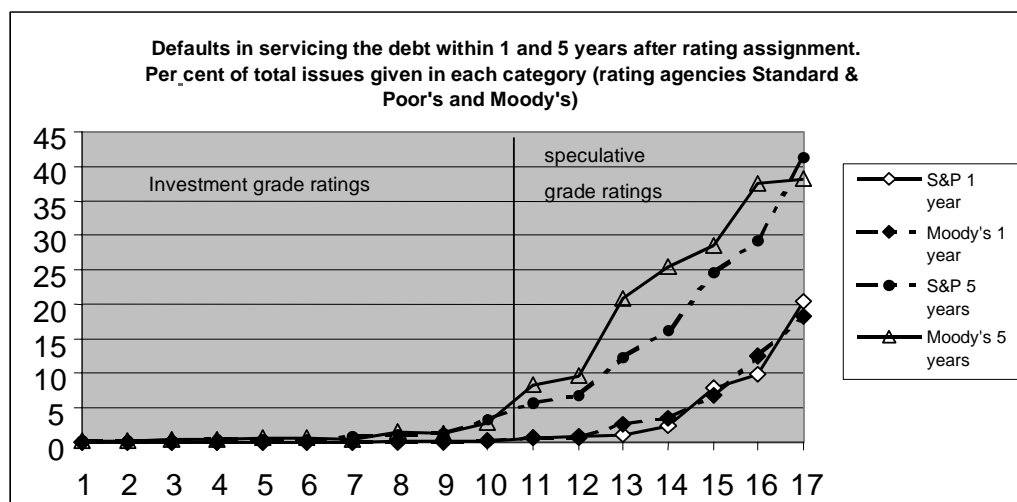
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<sup>4</sup> Fitch considers this aspect in the case of defaulted ratings: DDD rating is given to those debts where 90% of the debt (including accrued interest) can be recovered, DD to those debts where 50-90% can be recovered and D where less than 50% is recoverable. The difference lies in the fact that Fitch determines the rating after the default.

The comparison of ratings is only possible if the ratings belong to the same class and have been prepared using the same methodology, therefore, it is often problematic to use the comparison of ratings; for sovereign ratings, mostly the rating of long-term obligations nominated in foreign currency is used because it contains the component of country's risk and transfer risk. As mentioned before, the lack of such obligations does not hinder the giving of a rating.

Appendix 1 provides a general description of different ratings of the major rating agencies (Monfort and Mulder, 2000, Appendix 1; information by rating agencies).

Much research has been done concerning the adequacy of ratings. Figure 1 shows empirical data concerning the number of ratings of bond issues<sup>5</sup> and the number of defaults in servicing these bonds (a) within the first year following the issue of a rating and (b) within 5 years after assigning the rating. The data from 1981 to 1998 have been used (BIS, 2000, p 127). As can be seen from the figure, higher rated bonds had very few problems (AAA to A-ratings are in groups 1-7).



**Figure 1. Correlation of ratings and defaults (data from BIS 2000).**

Also the correlation of interest rates and ratings has been studied. For instance, investment bank Credit Suisse First Boston (CSFB) studied the bonds of four investment grade groups (BBB, BBB+, A- and A) over the last 8 years and concluded that the behaviour of interest rates was practically the same for all four groups, ie it did not depend considerably on the difference of the rating (The Economist, 1999b). The same does not hold true for bigger differences in rating groups, though.

<sup>5</sup> Analysis covers private bonds.

## 1.4. Estonian Rating

Estonia has ordered sovereign ratings since 1997 using three rating agencies: Moody's, Fitch (IBCA) and Standard & Poor's. At first Fitch gave Estonia one level lower rating than the other agencies (BBB), but by the end of 2000 all three agencies had assigned Estonia the same investment grade rating BBB+/Baa1 which is the highest rating in BBB category (defined as "*An insurer has adequate capacity to meet its financial commitments. However, adverse economic conditions or changing circumstances are more likely to lead to a weakened capacity of the insurer to meet its financial commitments*" (Standard & Poor's web-page))<sup>6</sup>. Standard & Poor's added positive outlook to Estonian rating in autumn 2000 and Fitch in summer 2001. Fitch was the first rating agency to upgrade Estonian sovereign rating to A-level in August 2001.

As at the end of 2000, Estonian rating stood three levels higher as compared to the mean rating of other emerging markets, which was BB+/Ba1. The highest rating among transition economies – A/A2 – has been given to Slovenia, in 2000 Standard & Poor's upgraded the Czech rating to A-/A3 and Moody's gave the same rating to Hungary. The ratings given to Latvia and Lithuania are 1 to 3 levels lower than the Estonian rating (information as at the end of 2000).

## 2. Factors Determining Credit Ratings. Results of Previous Researches

### 2.1. Overall Comments

Identifying empirically the relationship between determinants of credit rating and actual ratings is difficult. First, because some of the criteria are not measurable and the rating agencies do not provide guidance on the relative weights they assign to each factor (Cantor, Packer p 39). Secondly, it is unclear if the list of credit ratings is ordinal or cardinal. The third problem is that some of the explanatory variables can be correlated to each other and, finally, there is a problem that ratings of countries with similar economic conditions but different geographic location or other non-economic factor may differ significantly (Haque *et al*, p 28).

The first problem can be solved by leaving not measurable factors out of analysis, because not measurable factors are mostly political in nature and creditworthiness indicators are explained mainly by the economic performance of the countries rather than their political situation (Haque *et al*, p 19). Another option is the introduction of dummy variables. In our analysis not measurable factors are left out of empirical analysis and are only shortly discussed after that.

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<sup>6</sup> The next A category sovereign ratings (ie ratings A- ... A+) are defined as: "*An insurer has strong capacity to meet its financial commitments but is somewhat more susceptible to the adverse effects of changes in circumstances and economic conditions than insurers with higher-rated categories.*"(Standard & Poor's web page)

The second problem has been solved by assuming that the list of credit ratings is linear and cardinal. Many researchers have assumed that it is and, therefore, have used regression analysis in analysis (for instance Cantor, Packer, p 40). At the same time, there are also papers where the linearity and cardinality of the list of credit ratings has been called into question (for instance Sabourin, p 4 and Haque *et al*, p 20) and, therefore, logit models or cluster analysis have been suggested instead of regression analysis. In this paper the list of credit ratings is assumed to be linear and cardinal, however, as this may not be a valid assumption, the analysis that is carried out is only analytical not including any econometric estimation. Also, the correlation of different factors is not a problem if the ratings are not estimated econometrically.

The last problem is solved by analysing Estonian rating separately in three groups: in the context of transition countries, in the context of developed European countries and in the context of countries with similar ratings. Here the first group consists of countries with similar history, the second group consists of countries with similar geographical location and the third group consists of countries with similar rating, but with different political, geographical, and other situations. Therefore, it is possible to analyse and compare the ratings of countries with both similar and different backgrounds.

The following is the analysis of the importance of different factors that have been used as explainers of credit rating in previous researches.

## 2.2. Per Capita Income and GDP Growth

Per capita nominal income is mostly used as a proxy of potential tax base. The greater the potential tax base of the borrowing country, the greater the ability of a government to repay debt. This variable can also serve as a proxy for the level of political stability and other important factors (Cantor, Packer p 39).

In empirical papers per capita income has been a good explainer, ranging from B/B ratings having per capita income \$2610-\$3370 to Aaa/AAA ratings having per capita income \$23560 (Cantor, Packer p 41).

A relatively high rate of economic growth suggests that a country's existing debt burden will become easier to service over time (Cantor, Packer p 39, also mentioned as potential explanatory variable in Haque *et al*, p 3). Instead of the growth rate of GDP, the growth rate of exports has also been used in some studies (Haque *et al*, p 14).

In empirical analysis GDP growth has been statistically significant only in explaining the ratings by *Institutional Investor* and *Euromoney* in econometric study that covered over 60 developing countries (Haque *et al*, p 27). In other studies it has been mostly a bad explainer. Countries with lower ratings tended to have higher economic growth and vice versa (Cantor, Packer p 41). Given that lower ratings usually mean poorer countries (see above), it can be explained by catch-up effect or unconditional  $\beta$ -convergence.



### 2.3. Inflation

A high rate of inflation points to structural problems in the government's finances. When a government appears unable or unwilling to pay for current budgetary expenses through taxes or debt issuance it must resort to inflationary money finance. Public dissatisfaction with inflation may, in turn, lead to political instability (Cantor, Packer p 39).

In empirical studies inflation has usually been a good explainer. B/B ratings have on average annual inflation 13%-62%, Aaa/AAA ratings 2.7%-2.9% (Cantor, Packer p 41). Some studies show also that the relation between ratings and inflation is not linear - annual inflation higher than 300% tend to lower the ratings significantly (Haque *et al*, p 27).

### 2.4. Fiscal and External Balance

A large fiscal deficit absorbs private domestic savings and suggests that a government lacks the ability or will to tax its citizenry to cover current expenses or to service its debt (Cantor, Packer p 39). Usually central government balance is used because of data availability, although a more satisfactory measure would be the consolidated deficits of the state, local and quasi-public sectors (Cantor, Packer p 50).

In empirical studies (for instance Cantor, Packer p 41) fiscal balance has had no correlation with the rating.

A large current account deficit indicates that the public and private sectors together rely heavily on funds from abroad. Current account deficits that persist result in growth in foreign indebtedness, which may become unsustainable over time (Cantor, Packer p 39, also mentioned as potential explanatory variable in Haque *et al*, p 3).

In empirical studies external balance has had a small correlation with rating - B/B ratings have external balance -1%...-3.4%, while Aaa/AAA ratings have usually external balance in small surplus (+1%...+3%). At the same time, however, A/A ratings have bigger external deficit than Baa/BBB ratings (Cantor, Packer p 41). In econometric study current account balance was significant in a study by Haque *et al* (Haque *et al*, p 27).

### 2.5. External Debt

A higher debt burden should correspond to a higher risk of default. Usually the debt burden is measured as government foreign currency debt ratio to exports (Cantor, Packer p 39), but also debt ratio to GDP (Sabourin, p 2, Haque *et al*, p 3), debt service payments to GDP and interest payments to GDP (Haque *et al*, p 3) have been used. Domestic currency debt is also paid attention to, but rating agencies generally give greater weight to foreign currency debt (Cantor, Packer p 50).

In empirical studies external debt level has been a good explainer of rating. Better ratings have clearly smaller external debt (Cantor, Packer p 41, Sabourin, p 7).

## 2.6. Threshold Levels of Economic Development

Although the level of development is already measured by per capita income, the rating agencies appear to factor also a threshold effect. For instance, whether or not a country is classified as industrialised by IMF (Cantor, Packer p 39). Such a classification is taken also as a measure of economic integration, industrialised countries are more integrated to each other and, therefore, have less risk to default and vice versa (Cantor, Packer p 50).

Empirical analyses show that if a country is classified as industrialised, then it considerably raises the possibility of having an A- or higher level rating (Cantor, Packer p 41).

## 2.7. Default History and Other Factors

A country that has defaulted on debt in recent past is widely believed to do so also in the future (Cantor, Packer p 40) and usually such a country cannot get a rating over B level (Cantor, Packer p 41). Besides defaults, former rescheduling and subjective political considerations can also be paid attention to (Haque *et al*, p 3).

Other factors that have been mentioned in different studies are:

- tax efforts. If the state's effort to collect taxes is higher, it shows greater will to repay debt (Sabourin, p. 2). It was significant in modelling ratings of Canada's provinces (Sabourin, p 7);
- employment growth. Higher employment means more tax-payers and less unemployment benefits to be paid, therefore, also better fiscal situation (Sabourin p 2);
- unemployment rate. The more unemployed, the worse is the economic situation and, therefore, the lower the rating (Sabourin, p 2);
- share of employment in manufacturing sector to total employment. The bigger the manufacturing sector, the smaller the risk of possible crises (Sabourin, p 2). Was statistically significant in modelling ratings of Canada's provinces (Sabourin, p 7);
- correlation of GDP growth to the growth cycle of neighbouring large territories. The smaller is the correlation, the less diversified is the economy and, therefore, there exists a bigger risk of country-specific shock (Sabourin, p 2);
- savings to investments ratio (Haque *et al*, p 3). The more savings, the more stable is the economy;
- reliance on a single export good. It is an additional risk variable (Haque *et al*, p 3);
- the ratio of international reserves to import. The higher the ratio, the less probable is a sudden liquidity crises and, correspondingly, the higher the rating (Haque *et al*, p 11). It was statistically significant in the econometric study by Haque *et al*. (Haque *et al*, p 27);
- real exchange rate as a measure of terms of trade. Increase in REER means decrease in terms of trade and, therefore, also in credit rating (Haque *et al*, p 14). It was statistically significant in an econometric study that covered over 60

developing countries, but turned insignificant when also CA balance and GDP growth were included in regression (Haque *et al*, p 27);

- world interest rate. Higher interest rate means higher debt servicing costs and, therefore, lower rating. Was statistically significant in the econometric study by Haque *et al*. (Haque *et al*, p 27).

### 3. Empirical Analysis

#### 3.1. Included Variables, Countries and Their Ratings

For empirical analysis the following variables were chosen:

- GDP per capita. Figures of year 2000 were used<sup>7</sup>.
- Average real GDP growth. As GDP growth depends on business cycle, then average of years 1997 – 2000 was used.
- CPI inflation, average of years 1997 – 2000 was used, because it depends also on business cycle.<sup>8</sup>
- REER. Overall change in years 1997 – 2000 was used.
- Fiscal balance as ratio to GDP. As it depends also on business cycle, average of years 1997-2000 was used.
- CA deficit as ratio to GDP, average of years 1997-2000 was used.
- Government debt ratio to exports and GDP<sup>9</sup>. Figures of year 2000 were used.
- Unemployment rate. Figures of year 2000 were used.
- Threshold level of economic development. It was analysed in the case of CEE countries (+ Malta and Cyprus) and three indicators were used: 1) the correlation of RGDP growth to EU RGDP growth (average of 1996 – 2000); 2) the number of not opened, opened and closed chapters during the EU accession negotiations and 3) the EBRD transition index.
- The ratio of international reserves to import, data of year 2000 was used.

Default history was not included, as no country in the analysis (except Russia) has had problems with debt payments. And also Russia's rating is back from default level to B (B-) level.

Employment growth was excluded as many countries in the analysis have had significant decline in their population because of migration. Also, the effects of employment changes are partly included in the unemployment figures used in the analysis. The share of employment in manufacturing sector to total employment was excluded, as no comparable data is available.

The ratio of saving to investment was excluded from the analysis, as it has not been significant in previous empirical papers. The world interest rate was excluded, because it is the same for all countries and, therefore, cannot explain the differences

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<sup>7</sup> The time frame (data of year 2000 or average data of 1997 – 2000) was chosen according to subjective judgement on given variable's dependency on business cycle.

<sup>8</sup> Because the dependance of inflation from business cycle is not so clear as, for instance, in the case of RGDP growth, here also data of year 2000 was analysed. But, as it did not give such clear results as average data of 1997 – 2000, it is not presented.

<sup>9</sup> Government overall debt level was used instead of government foreign currency debt because of data availability.

between ratings of different countries. Similarly, the reliance on single export goods was not considered in this paper.

The countries in the analysis were grouped as following:

- Estonia and other transition and former socialist countries: Estonia, Latvia, Lithuania, Czech Republic, Slovak Republic, Hungary, Poland, Slovenia, Bulgaria, Romania, Russia, Moldova, Kazakhstan, China, Mongolia, Azerbaijan and Croatia. Table with their ratings is given in Appendix 2.
- Estonia and European developed countries: Austria, France, Germany, Luxembourg, Netherlands, Norway, Switzerland, United Kingdom, Belgium, Denmark, Finland, Ireland, Spain, Sweden, Italy, Portugal, Iceland, Cyprus, Israel, Greece, Malta, Estonia. Table with their ratings is given in Appendix 3.
- Estonia and countries with nearby ratings: Iceland, Cyprus, Hong Kong, Malta, Slovenia, Barbados, Chile, Czech Republic, Greece, Israel, Estonia, Hungary, Poland, China, Korea, Latvia, Malaysia, Qatar, Tunisia, Croatia, Egypt, Lithuania, South Africa, Thailand, Trinidad & Tobago, Uruguay. Table with their ratings is given in Appendix 4.

The most recent rating was used and ratings were transformed to numerical scale as shown in Table 1:

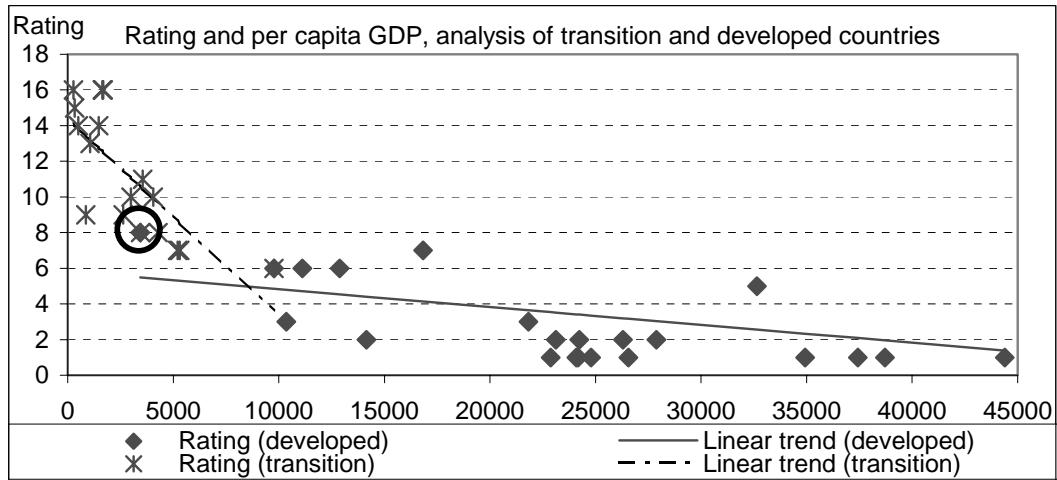
**Table 1. Transformation of ratings to numerical scale.**

Rating	AAA	AA+	AA	AA-	A+	A	A-	BBB+	BBB	BBB-	BB+	BB	BB-	B+	B	B-
Num. scale	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

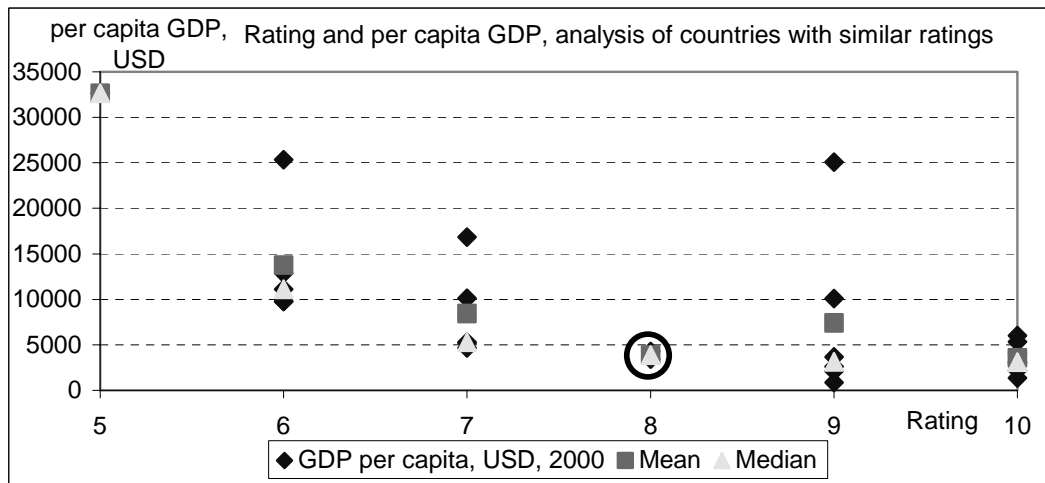
## 3.2. Empirical Analysis

### 3.2.1 Rating and Per Capita GDP.

The relationship between credit rating and per capita GDP among different groups can be seen from Figures 2 and 3. Table with corresponding data is in Appendices 5-7.



**Figure 2. Rating and per capita GDP. Analysis of transition and developed countries<sup>10</sup>.**



**Figure 3. Rating and per capita GDP. Analysis of countries with similar ratings.**

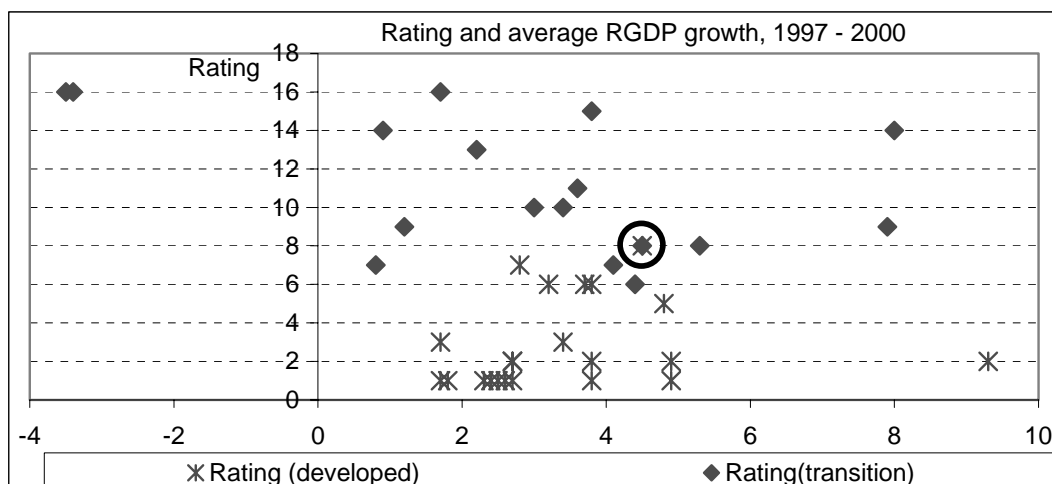
From the figures and data in the appendix we can make a conclusion that per capita GDP and ratings are strongly related ( $R^2$  of estimated trend lines between 0.37-0.59). We can see that Estonian per capita GDP is the lowest among BBB+ and better rated countries, being even closer to one step lower, BBB median than to Estonia's own group, BBB+ median. This shows that given our present level of per capita GDP, our rating is very good and the upgrade of rating is constrained. In order to be comparable with the mean and median of countries with one step higher rating (A-), Estonian nominal GDP has to raise about 2.5 – 3 times (rise at least 36% is needed in order to reach the minimum level of per capita GDP of A- countries).

Low per capita GDP is also pointed out by some rating agencies in their report about Estonia as one factor that constrains Estonian rating.

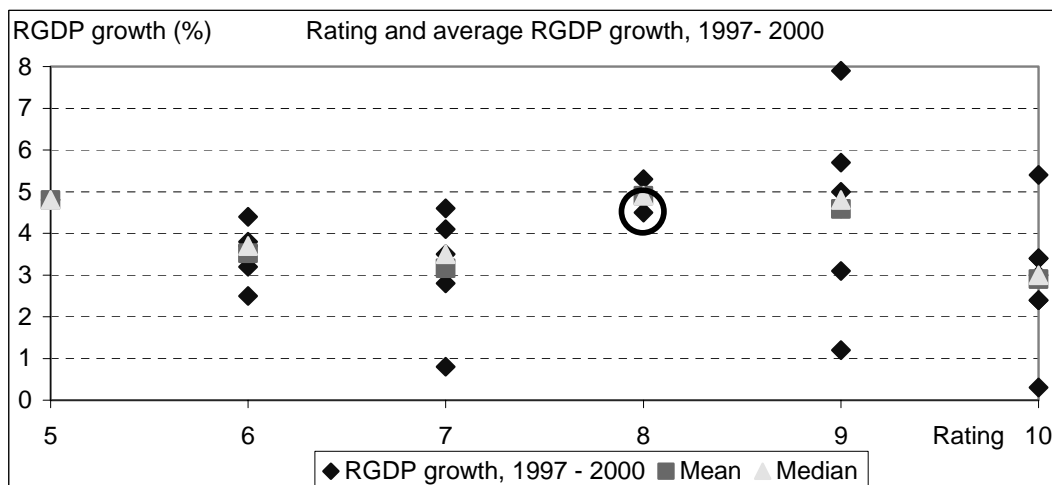
<sup>10</sup> Here and onwards: 1) relation is considered to exist and trend lines are shown on figure if their  $R^2 > 0.3$ ; 2) Estonian rating is rounded with circle.

### 3.2.2 Rating and Average Real GDP Growth

The relationship between credit rating and growth level of real GDP (RGDP) among different groups of countries can be seen from Figures 4 and 5. Table with corresponding data is in Appendices 5-7.



**Figure 4. Rating and average RGDP growth. Analysis of transition and developed countries.**



**Figure 5. Rating and average RGDP growth. Analysis of countries with similar ratings.**

From figures and data in the appendix we can see that there is no significant positive relationship between credit rating and RGDP growth. At the same time we can see from Figure 3 some (although very weak) support for the hypothesis of unconditional  $\beta$ -convergence of real GDP level among less developed European and more advanced transition countries. The economies of more advanced transition economies and less advanced developed economies (countries with ratings from BBB- to A+) tend to grow faster (RGDP growth median 3.7) than more developed, high rating (from AA to AAA) economies (RGDP growth median 2.7). At the same time, the convergence cannot be observed among less developed countries, for instance the median of RGDP

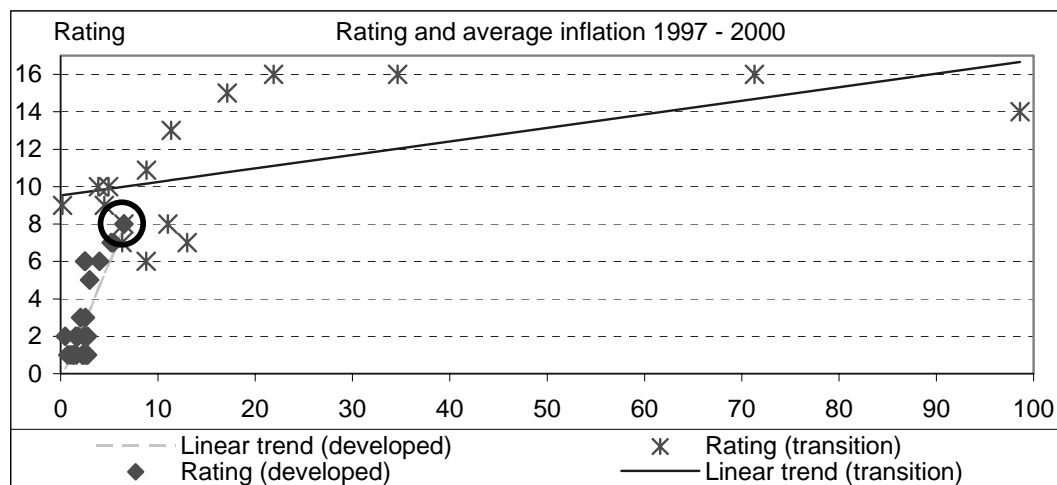
growth among B-, B and B+ countries is 1.3. Also the convergence cannot be observed if we include in our analysis countries with similar ratings from other parts of the world (Figure 5).

As the analysis of per capita GDP showed that Estonian GDP level is rather low even for our present rating, then we can make a conclusion that in order to maintain our present rating, the continuity of high growth rate of real GDP is needed. Only so we will be able to reach also possible higher ratings in the future. At the same time, long and continuous decline in RGDP growth rate can be even a threat to our present rating.

High RGDP growth level with increasingly diversified private sector as the main engine has been pointed out also by Standard & Poor's (Standard & Poor's 2001, p 1) as one of the main supporters of Estonian rating.

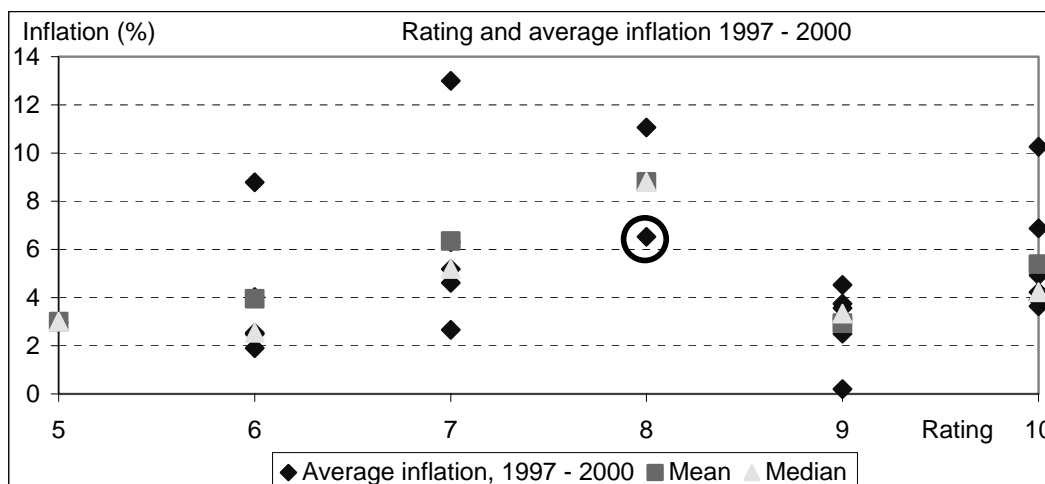
### 3.2.3 Rating and CPI Inflation

As CPI inflation has business cycle fluctuations, the relationship between inflation and rating was analysed as average of years 1997 – 2000. The relationship between credit rating and CPI inflation among different groups can be seen from Figures 6<sup>11</sup> and 7. Table with corresponding data is in Appendices 5-7.



**Figure 6. Rating and average CPI inflation. Analysis of transition and developed countries.**

<sup>11</sup> From Figure 6 Azerbaijan was excluded because of deflation.



**Figure 7. Rating and average CPI inflation 1997 - 2000. Analysis of countries with similar ratings.**

From the figures and data in appendices we can make a conclusion that there is a negative relation between rating and CPI inflation – countries with lower CPI inflation tend to have better ratings and vice versa. The relationship is strong,  $R^2$  of estimated trend line 0.66 in the case of developed countries and 0.32 in the case of transition countries<sup>12</sup>.

We can see that countries that have average annual inflation rate over 20% do not have ratings better than B level. We can also see that countries with rating A+ or better do not have average annual inflation more than 3%.

Estonian inflation is the lowest among BBB+ rated countries, suitable also to A-group. It seems that if Estonian annual inflation rate stabilised at 4-5% level for a longer period, then our inflation rate would allow Estonian rating to be at least one step higher<sup>13</sup>.

Future inflation perspective of 4-5% is also mentioned in Standard and Poor's report (Standard & Poor's 2001, p 1) as one factor supporting Estonian present rating.

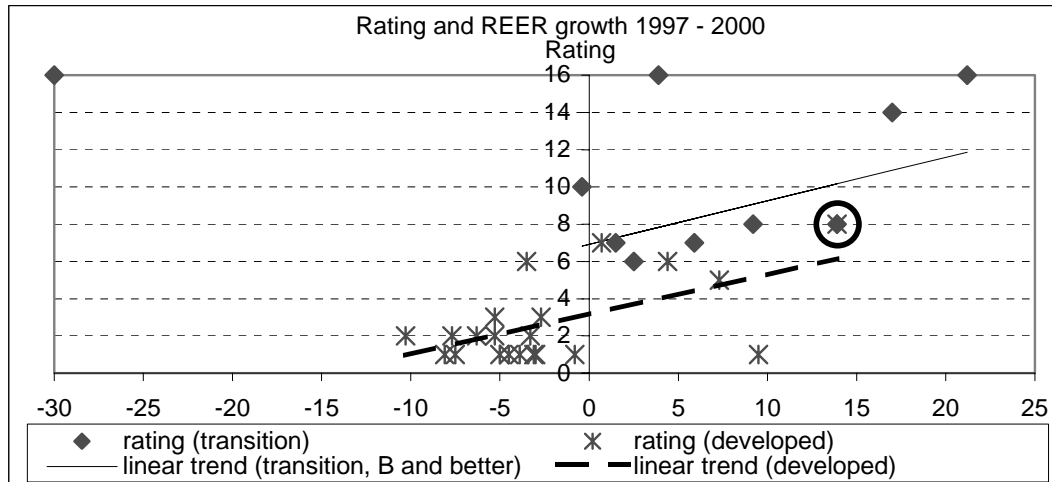
### 3.2.4 Rating and Dynamics of REER

REER index is influenced by two factors – CPI inflation and nominal exchange rate. Higher REER means higher CPI growth and/or revaluation of domestic currency with respect to main trading partners. The relationship between rating and REER growth between years 1997 – 2000 among different country groups can be seen from Figures 8 and 9, a table with the corresponding data is in Appendices 5-7.

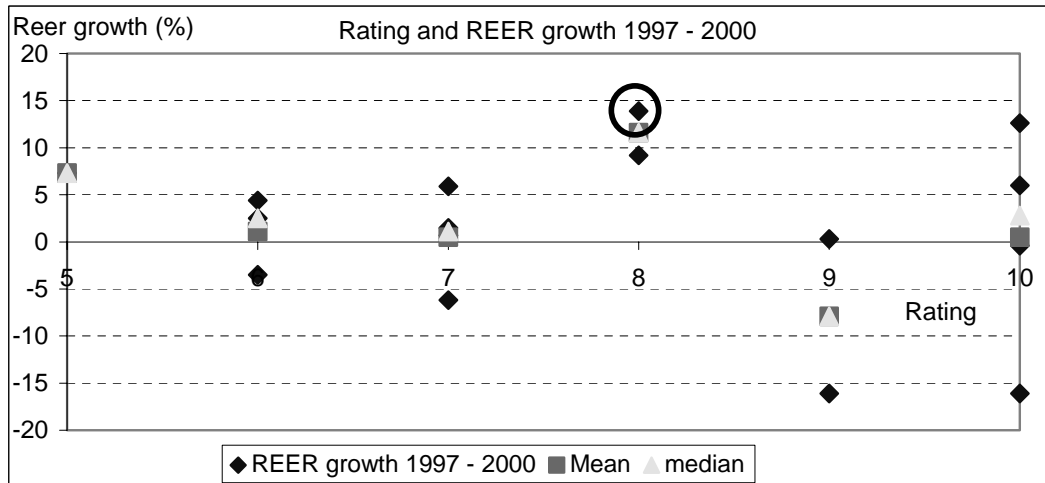
<sup>12</sup> If we consider only one year's data (2000), then the relationship exists only in the case of transition countries ( $R^2$  of trend line 0.31). In the case of developed countries there is practically no relation, although their average inflation level is clearly lower than in the case of transition economies.

<sup>13</sup> The Fitch was the first rating agency to upgrade Estonian Sovereign rating to A level in the end of August 2001.





**Figure 8. Rating and REER growth 1997 - 2000. Analysis of transition and developed countries.**



**Figure 9. Rating and REER growth 1997 - 2000. Analysis of countries with similar ratings.**

From the figures and data in the appendix we can see that there exists a relation between rating and growth rate of REER ( $R^2$  of estimated trend line 0.34 in the case of developed countries and 0.32 in the case of transition countries with rating B or better). Countries that have declining REER, have also better rating because of rising price competitiveness of produced export goods.

Analysing Estonian situation we can see that Estonian position is between the trend lines estimated for developed and transition countries. If we consider the trend line of transition countries, we can see that Estonian rating is too good given our REER growth level, at the same time the trend line of developed countries would allow Estonian rating to be up to 2 levels higher. The figure of countries with similar ratings, however, supports also the conclusion that Estonian REER growth is too high.

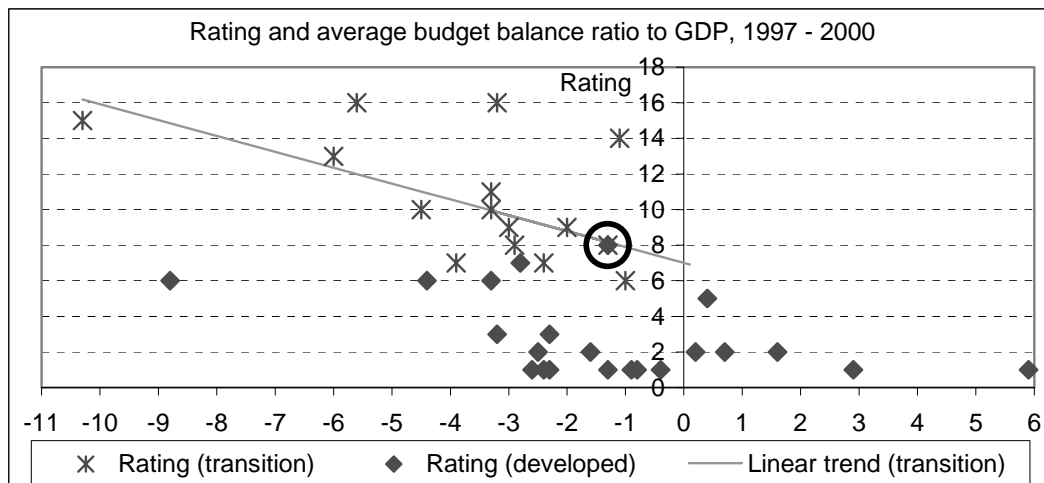
At the same time we have to keep in mind that the rise in Estonian REER is mainly due to Russian crisis in late 1998 – beginning of 1999, that caused a significant

reevaluation of Estonian kroon against Russian rouble. If we consider only the change in REER against developed European trade partners, then the growth rate of Estonian REER is comparable with that of Poland – about 10% in years 1997 – 2000. Also we have to keep in mind that the competitiveness also consists of other factors besides relative exchange rate, for instance, the rise in real productivity in Estonian enterprises has also been rather high in those years.

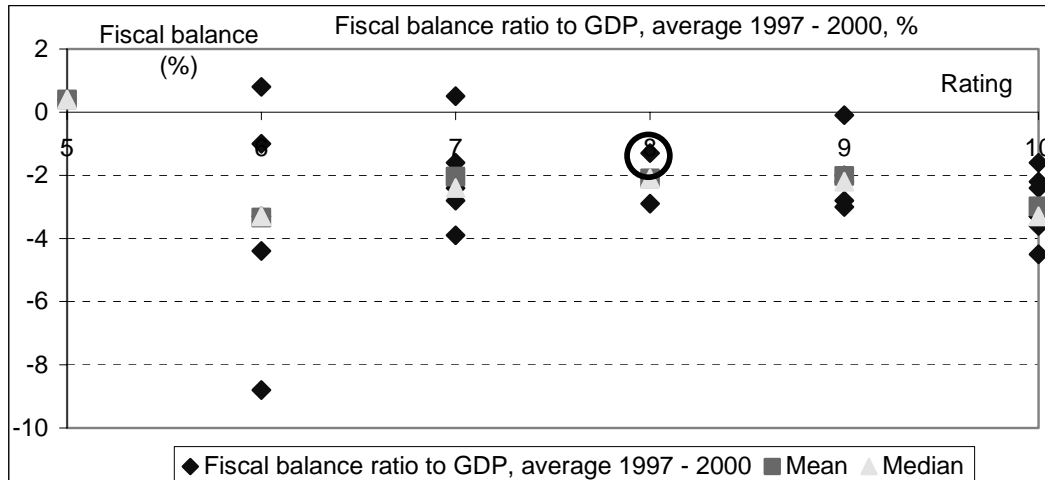
The rating agencies, too, have pointed out and expressed their concern about Estonian rising REER. But in all cases their final conclusion has been that as export and productivity growth continues to be high, the rise in REER does not express any competitiveness problems. Therefore it is important for Estonia to show to rating agencies besides average REER index also the decomposition of REER to industrialised and transition trade partners and the growth figures of productivity and export in order to avoid any possible misunderstandings that may appear if they see only the figures of average REER.

### 3.2.5 Rating and Fiscal Balance Ratio to GDP

As fiscal balance depends on business cycle, the average balance of years 1997 – 2000 was used. The relationship between rating and fiscal balance can be seen from Figures 10 and 11, data is given in Appendices 5-7.



**Figure 10. Rating and average fiscal balance 1997 - 2000. Analysis of transition and developed countries.**



**Figure 11. Rating and average fiscal deficit 1997 - 2000. Analysis of countries with similar ratings.**

From the figures above and data in the appendix we can draw a conclusion that the majority of analysed countries have average fiscal deficit 0-5% of GDP. Countries having fiscal surplus have ratings A- or better, countries having average deficit more than 5% have ratings BB- or worse<sup>14</sup>. Estimated trend line shows significant relation only in the case of transition countries ( $R^2=0.34$ ).

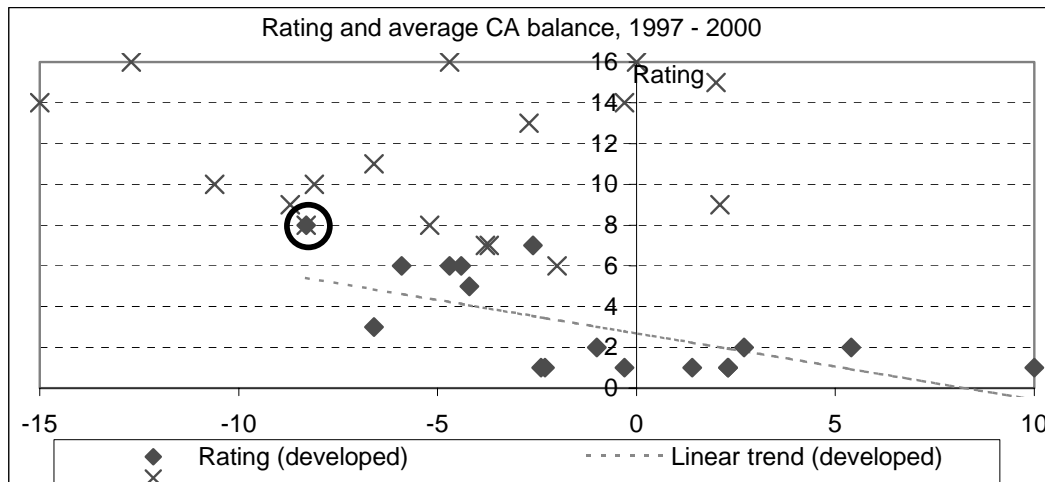
Estonian fiscal deficit of 1.3% is the lowest in BBB+ group, but we cannot make strong conclusions about that as both neighbouring BBB and A- groups have lower mean of deficits than Estonian group BBB+. Only one conclusion is clear – in order to maintain our present rating and/or get possible better ratings in the future, Estonian fiscal deficit may not accelerate over 3(4)%.

Sustainability of Estonian fiscal position is mentioned also by Moody's (Moody's 2000, p 1) as one of the key factors that guarantees the stability of Estonian rating in the future.

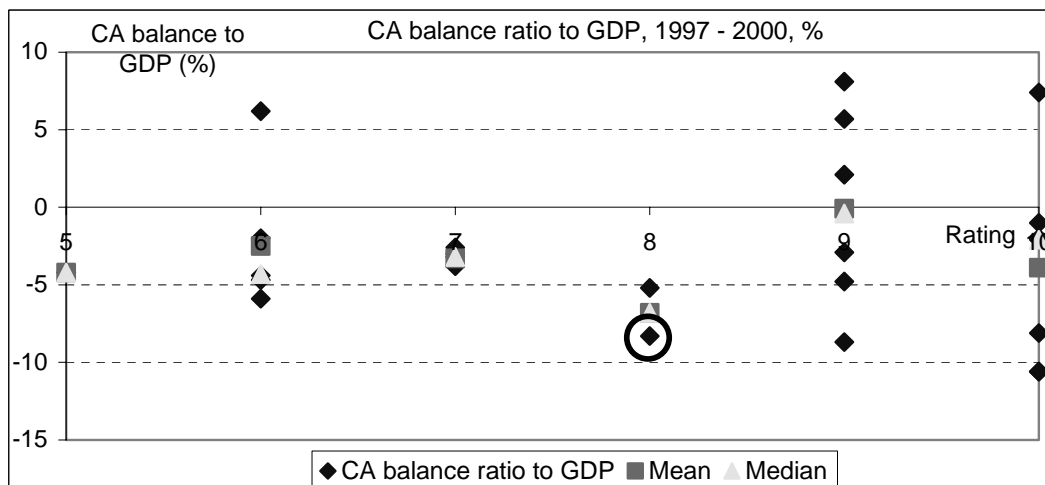
### 3.2.6 Rating and Current Account (CA) Balance Ratio to GDP

As CA balance depends on business cycle, the average of years 1997 – 2000 was used. The relationship between rating and CA balance ratio to GDP among different groups of countries can be seen from Figures 12 and 13. Corresponding data is given in Appendices 5-7.

<sup>14</sup> Except Malta, that has rating A and average fiscal deficit 8.8% of GDP.



**Figure 12. Rating and average CA balance ratio to GDP, 1997 - 2000. Analysis of transition and developed countries.**



**Figure 13. Rating and average CA balance ratio to GDP, 1997 - 2000. Analysis of countries with similar ratings.**

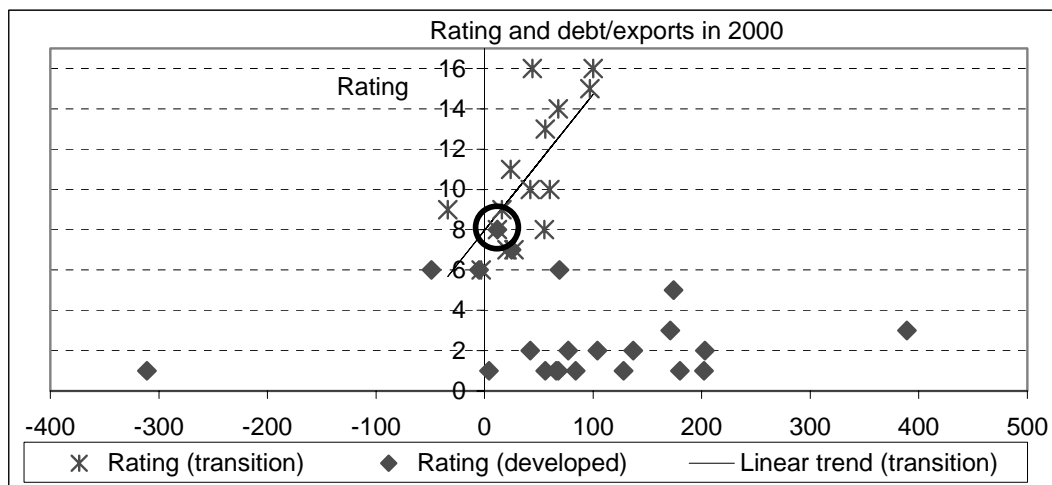
From the figures and data in the appendix we can see that there exists a relation between CA balance and rating among developed countries ( $R^2$  of estimated trend line 0.38). Countries with better ratings tend to have lower CA deficit or even surplus. Among transition countries there is no clear relationship, although, the highest CA deficits are among lower rated countries. Also, if we consider countries with similar ratings all around the world, there is no clear pattern.

Estonian CA deficit is the highest among countries rated BBB+ or better. The average CA deficit of countries with A+, A and A- ratings is about 3-5%, that is about half less than the deficit of Estonian CA. Therefore we can make a conclusion that CA deficit is another factor besides low per capita GDP that does not allow Estonian rating to be higher from its present level. In order to be comparable with countries with A- rating, Estonian CA deficit has to decline about twice.

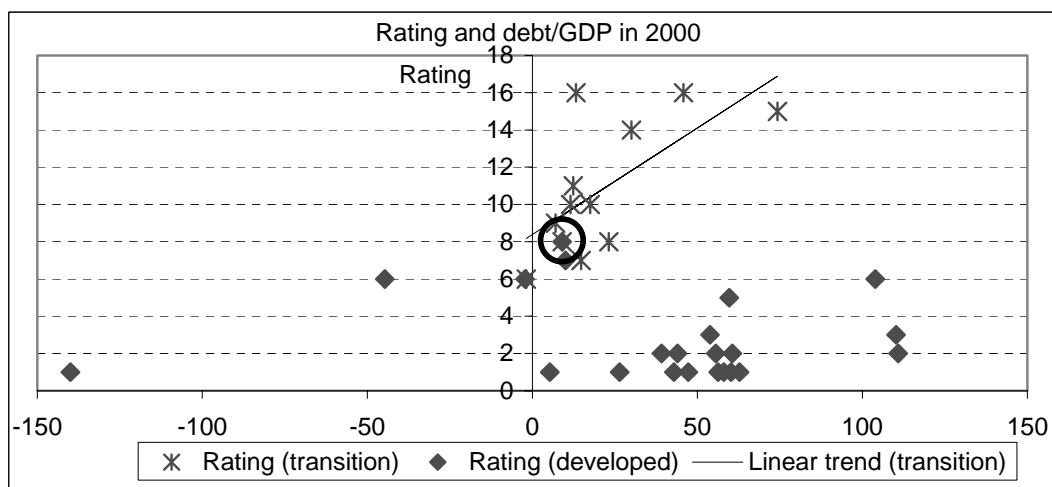
The problem of high CA deficit has also been mentioned in the reports of all three rating agencies. All agencies mention that Estonian rating is constrained by high CA deficit that can increase the debt burden in longer perspective (Moody's 2000, p 1; Standard & Poor's 2001, p 1, Fitch, 2000, p 0). At the same time, there are also positive notes – Fitch notes that the CA deficit has declined (Fitch 2000, p 1) and Standard & Poor's notes that the problem of high CA deficit is not big as the good perspectives of continuing high FDI inflow and low external debt level give enough flexibility to finance it (Standard & Poor's 2001, p 10).

### 3.2.7 Rating and Government Debt Ratio to Exports and GDP

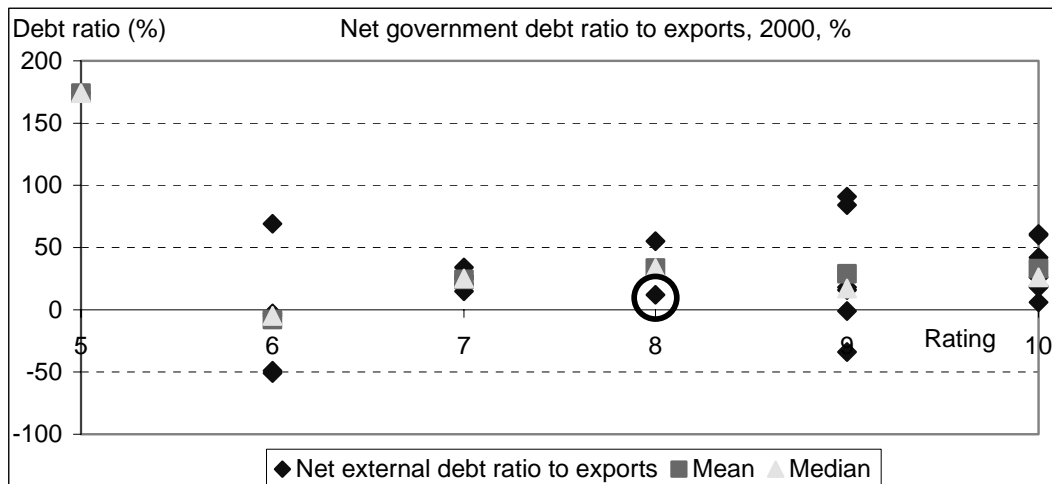
The relationship between rating and government debt ratio to exports in year 2000 among transition and developed countries is shown on Figure 14 and among countries with similar ratings on Figure 16. Debt ratio to GDP is correspondingly shown on Figures 15 and 17. Corresponding data is in Appendixes 5-7.



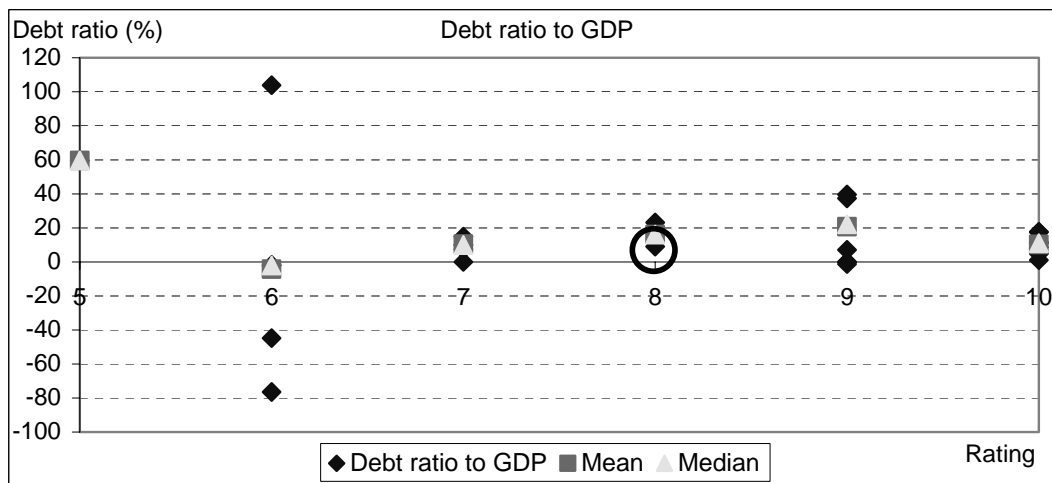
**Figure 14. Rating and government debt ratio to exports in year 2000. Analysis of transition and developed countries.**



**Figure 15. Rating and government debt ratio to GDP in year 2000. Analysis of transition and developed countries.**



**Figure 16. Rating and government debt ratio to exports in 2000. Analysis of countries with similar ratings.**



**Figure 17. Rating and government debt ratio to GDP in 2000. Analysis of countries with similar ratings.**

The figures show that there is no significant relation between government debt ratio and credit rating among developed countries and countries with similar ratings. But from Figures 14 and 15, also from data in the appendices we can see that there exists a negative relationship between debt level and rating among transition countries ( $R^2$  of estimated trend lines 0.63 and 0.44) – countries with higher debt level have lower ratings and vice versa. Estonian debt level is rather low and lies almost on estimated trend lines.

Estonian low public debt and mostly FDI-related private debt level is also pointed out by all rating agencies in their reports as one factor supporting Estonian rating. At the same time there are also negative tendencies – Standard & Poor's and Fitch have pointed out that the share of short term debt is relatively high and also the growth level of private sector debt is also relatively high without any political tools to slow it down. Therefore, it is important for Estonia to maintain conservative debt policy and

have low foreign debt level also in the future. From Figure 14 we can see that the acceleration of debt level can be allowed only in the case a country has already credit rating A+ or better.

### 3.2.8 Rating and Unemployment Rate

The relationship between credit rating and unemployment rate among transition and developed countries can be seen from Figure 18. The figure includes also a trend line estimated for countries with rating BB+ or better. Figure 19 shows relationship between credit rating and unemployment rate among countries with similar ratings. A table with corresponding data is in Appendices 5-7.

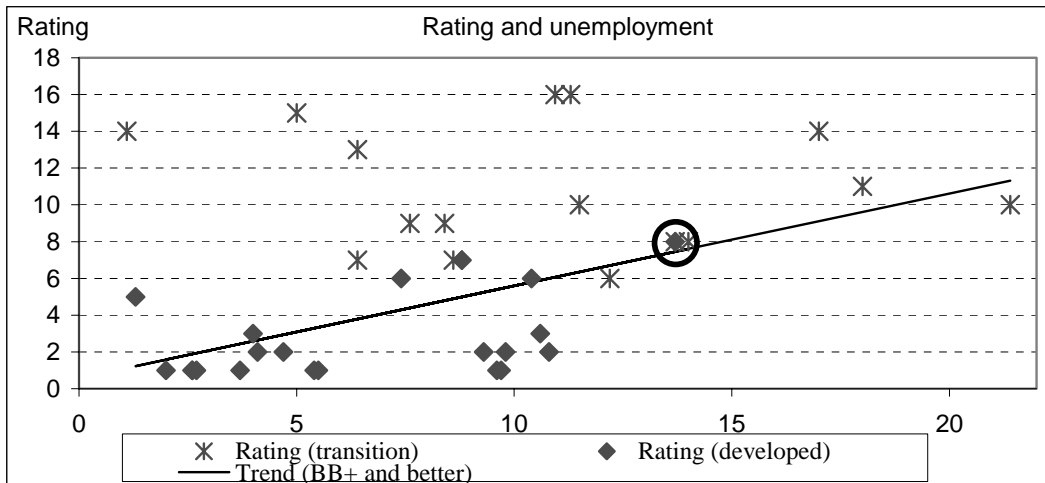


Figure 18. Rating and unemployment rate in 2000. Analysis of transition and developed countries.

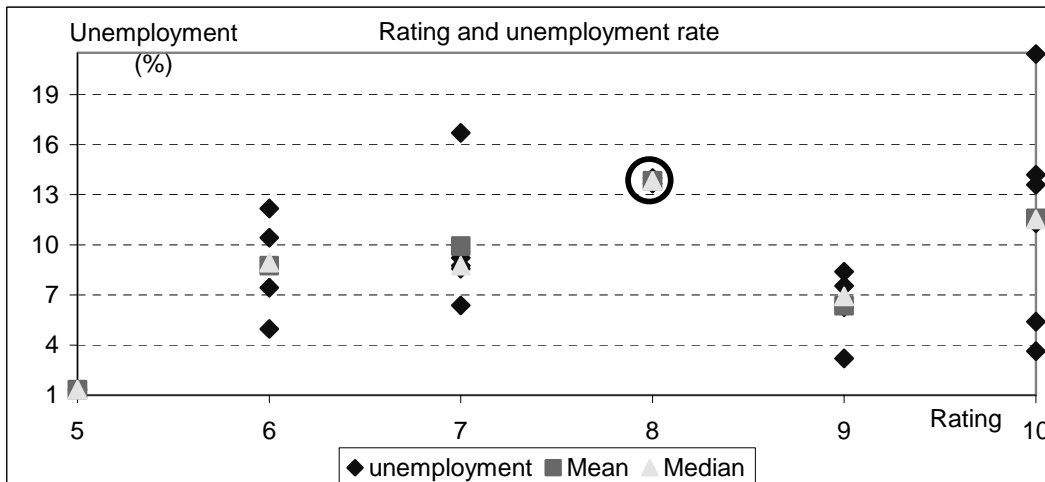


Figure 19. Rating and unemployment in 2000. Analysis of countries with similar ratings.

From the figures and data in the appendices we can see that there exists relationship between unemployment rate and rating ( $R^2$  of estimated trend line 0.40), if we do not

consider countries with ratings BB or worse. Estonian unemployment rate is rather high, higher than the mean of all considered country groups on Figure 19, but still lower than the trend line estimated on Figure 18. The variation of unemployment rate within different groups is also rather big, so it can be concluded that Estonian unemployment rate is not yet a real threat to Estonian present rating – there are countries with higher unemployment both in BBB+ and A- group.

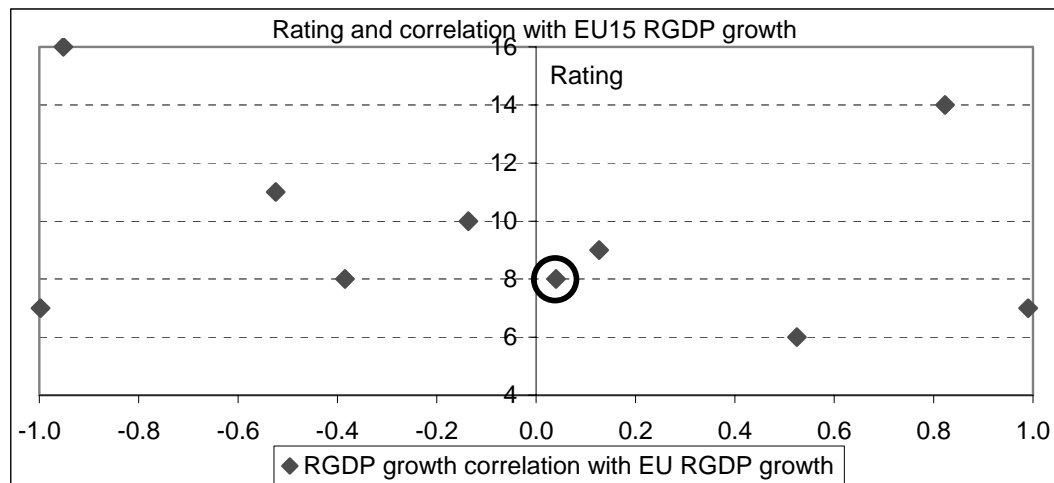
But although there is no present threat to rating, it remains still one factor that affects Estonian rating negatively. Also rating agencies have pointed that out in their reports – Fitch (Fitch 2000, p 0) writes that high unemployment and widening regional inequalities are one of Estonian weaknesses, Moody's (Moody's 2000, p 5) writes that high and structural unemployment and also rising youth joblessness are one of the main issues to be addressed in order for the rating outlook to remain stable.

### 3.2.9 Rating and Threshold Level of Economic Development

Analysis of threshold level of economic development was carried out in the case of Malta, Cyprus and CEE accession countries. Three indicators were used:

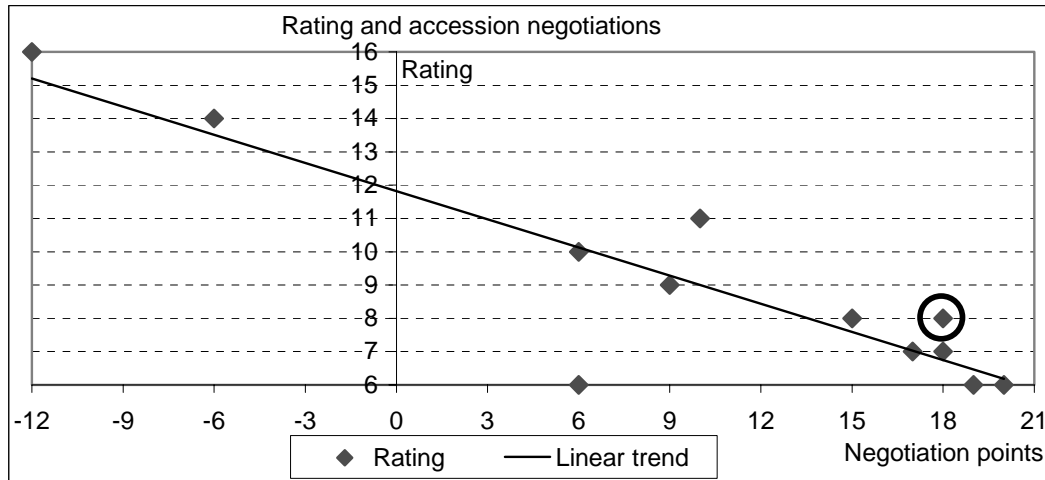
- the correlation of RGDP growth to EU RGDP growth. Average data of years 1996 – 2000 was used
- the number of not opened, opened and closed chapters during the EU accession negotiations. Here each closed chapter gave 1 point, opened chapter 0 points and not opened chapter –1 point.
- EBRD Transition index in 1999.

The relationships are shown on Figures 20 - 22, data as a table is in Appendix 8.

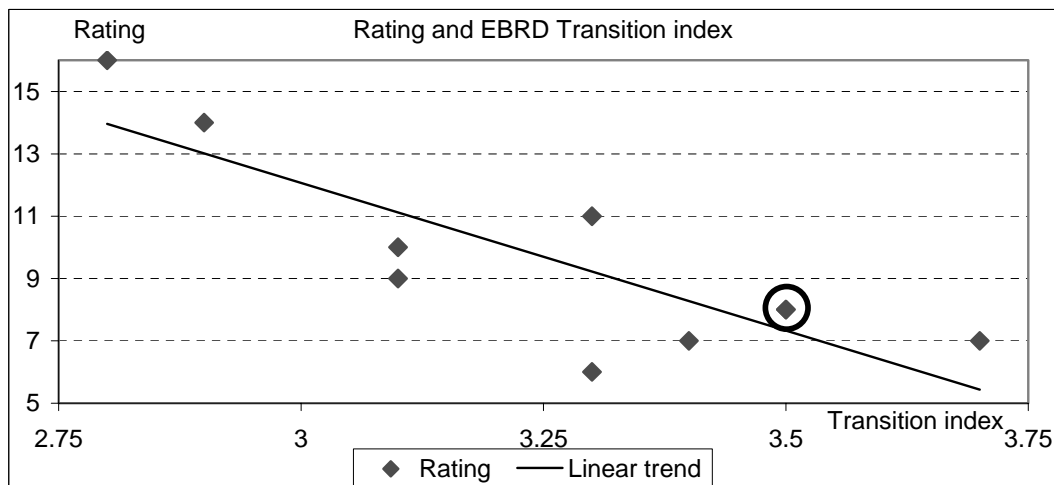


**Figure 20. Correlation of CEE transition economies RGDP growth with EU average RGDP growth.**





**Figure 21. Relationship between rating and the success of accession negotiations.**



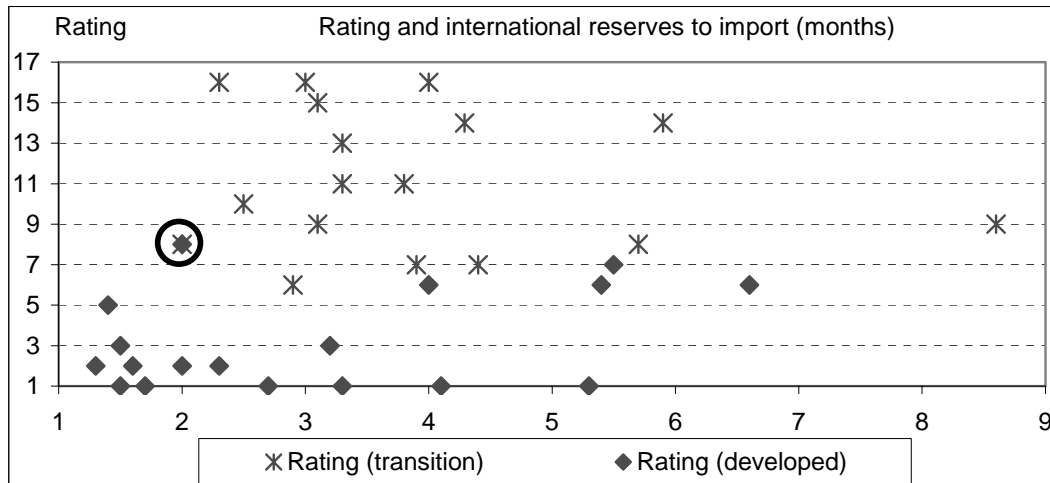
**Figure 22. Relationship between rating and EBRD Transition index.**

From the figures we can see that credit rating has a strong relationship between the success of EU accession negotiations and overall transition level measured by EBRD Transition index ( $R^2$  of estimated trend lines 0.80 and 0.69 respectively). The countries that have highest closed/not opened chapters' ratio within the negotiations and/or higher overall transition level have also higher rating. At the same time there is no significant relationship between rating and the correlation of RGDP growth.

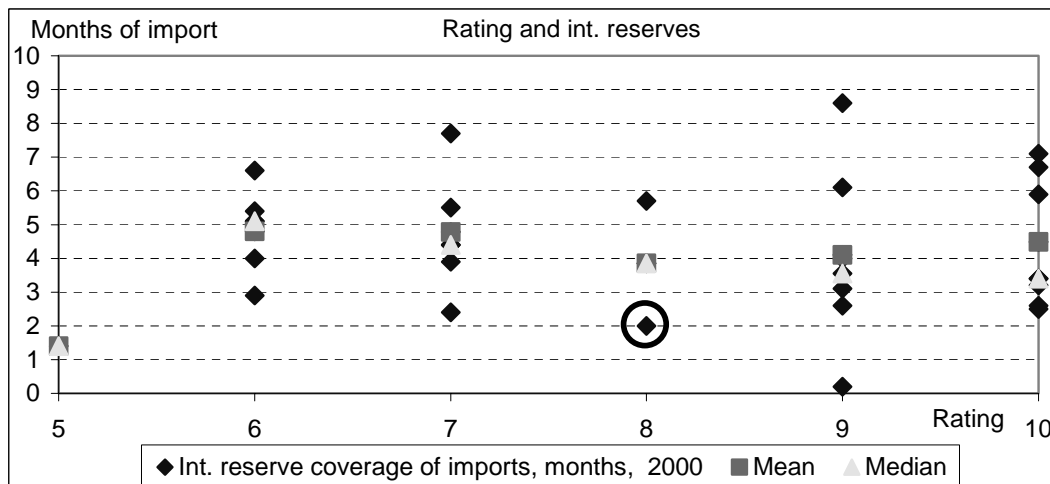
From Figure 21 we can see that Estonia has been rather successful with the EU negotiations and we would suit also to the countries of A- group. Also the EBRD Transition index allows for 1 level upgrade of rating. The accession/transition process as a whole and Estonian good position in it have also been pointed out by all three rating agencies as one of the main indicators that supports Estonian present rating and can give a positive outlook to Estonian rating if reforms progress and integration to EU continues.

### 3.2.10 Rating and International Reserves Ratio to Import

The relationship between international reserves ratio to import (measured as how many months' import can be covered with present level of international reserves) among transition and developed countries is shown on Figure 23 and among countries with similar ratings on Figure 24. Table with corresponding data is in Appendices 5-7.



**Figure 23. Rating and import coverage with international reserves. Analysis of transition and developed countries.**



**Figure 24. Rating and import coverage with international reserves. Analysis of countries with similar ratings.**

From the figures and data in the appendices we can make a conclusion that there exists no meaningful relation between the size of international reserves (measured as number of months they can cover countries import). Estonia has the shortest coverage of imports by international reserves among transition countries.

### 3.2.11 Other, Not Measurable Factors

Besides measurable factors there are factors like politics etc that are not measurable by any indicators, but can affect a country's creditworthiness and were mentioned in rating agencies' reports.

Estonia is a small and open country that has very strong relations with Scandinavian economies. Such smallness, openness and dependence mean that possible external shocks can have a rather big effect on Estonian economy.

There is a need for structural reforms and big investments in near future, such as pension reform, environmental investments, possible need for abandoning oil shale as the source of electricity etc. Considering the need for such investments, it will be difficult to maintain the balance of state budget without increasing the taxes. The risk is even higher as, at present time, there seems to be no consensus about the future costs and possible sources of financing of the reforms on the government level.

Uncertainty about future behaviour of Russia can have an effect through different channels. First, it can have a direct positive effect if the problem of double tariffs can be solved. But there are also possibilities for negative shock. These include the possible reduction of transit trade, Russian opposition to Estonian accession to NATO, possible problems in integration of Russian-speaking people etc.

At the same time Estonian consolidated and mostly foreign-owned banking system is considered to be one of the main strengths of the economy.

### 3.3. Comparison of the Results and SWOT Analysis

The results of the analysis of measurable factors determining the rating (chapters 3.2.1 – 3.2.10) is taken together and compared in Table 2.

**Table 2. Comparison of the results of the analysis.**

Factor	Description of influence	Previous explanation power	Rating agencies rhetoric's about Estonia <sup>15</sup>	Empirical findings of this work
<b>Per capita income</b>	Measure of tax base, proxy of political stability	Good	GDP per capita is low	Relation strong. Estonia suits merely to BBB+ group. For A- ab 50-100% of per capita GDP growth needed.
<b>GDP growth, X growth</b>	Measure of future debt burden developments	Bad explainer because of $\beta$ -convergence	high growth rates are positive	No relation (some indication of $\beta$ -convergence). For Estonia strong growth needed in order to reach higher per capita GDP level (see previous row)
<b>Inflation</b>	High inflation is indicator of structural problems	Good explainer. Relation not linear	low inflation rate is positive	Estonia on the edge of A- deviates from BBB+ mean and median for more than 4 percent points.

<sup>15</sup> Based on the Estonian sovereign rating reports that were published in the year 2000.

<b>REER growth</b>	High REER growth means decrease in competitiveness (terms of trade) and therefore possible decline in export	Good	REER growth is high, but as export growth is continuously high, then it is not a problem	REER figures can be negatively misleading in Estonian case. There is a need to decompose it to REER against developed and transition countries and always add data about productivity and export growth.
<b>Fiscal balance</b>	Fiscal deficit indicates living on debt	Bad explainer	Relatively low fiscal deficit is positive	Exists weak relation among transition countries, no relation among developed countries. Estonian deficit suites also to A/A- level.
<b>External balance</b>	Large CA deficit either increases debt burden or is financed by foreign capital inflow that can be unsustainable	Small explanatory power, statistically significant in study by Haque.	CA deficit is a problem	Exists weak relation among developed countries. Seems that Estonia has to decrease its CA deficit in order to get higher rating
<b>Government debt / X or GDP</b>	Higher debt burden shows higher risk of default.	Good explainer	Low level of debt is positive	Strong relation. Estonia has small debt, suitable also for A- rating.
<b>Threshold level of economic development</b>	Shows risk	Good explainer	EU accession perspective is positive	Rating has strong relation with EBRD Transition index and success of EU negotiations. Both indicators allow possible rise in rating.
<b>Employment / unemployment</b>	High level of unemployment shows risk.	Good explainer	High unemployment level is a problem	Strong relation among more developed countries. Estonian unemployment high.
<b>International reserves / M</b>	The higher the ratio, the less possible liquidity crises	Good explainer	Not mentioned	Practically no meaningful relation

From the table we can make the following conclusions:

- Per capita GDP is one of the most important factors that constrain Estonian rating. Therefore, in the near future strong emphasis should be put to high nominal GDP growth. CA deficit is also too high for A- level.
- Inflation, foreign debt level and fiscal deficit are already compatible with A- level. Therefore emphasis should be on keeping all of them from rising.
- REER index has to be analysed together with productivity and export growth figures, otherwise there exists possibility to make misleading negative conclusions.
- Unemployment level is also too high and can be a possible threat to our rating if it does not decrease in the future.
- As belonging to a group of certain level of economic development has strong positive impact on Estonian rating, any possible slowdowns in the process of transition and accession to EU should be avoided.

Taken together the results of Table 2 and the analysis of other, not empirically measurable factors in chapter 3.2.11 the following SWOT analysis of Estonian rating was carried out (table 3.):

Table 3. SWOT analysis of Estonian rating outlook

Strengths	Solid structure of economy, orientation and progress to market economy; Continuing inflow of direct investments; Good transportation system and infrastructure that support transit and export; Trade has reoriented from East to EU, big share of higher value-added high-tech products; Low public and external debt; Low inflation; Consolidated and foreign owned banking sector; Government budget expected to be balanced in medium term.
Weaknesses	Environment and energy; Big regional differences; High structural unemployment; Still large CA deficit;
Opportunities	Normalise the relations with Russia; Quick EU accession; Reform of the education system; Increase the share of value added goods in exports.
Threats	Russia (double tariffs, against accession to NATO etc); Raising wages can erode competitiveness; Increasing credit growth; Pension and other structural reforms can cause budget deficit and/or tax rise.

Overall conclusion: there is no threat to Estonian present rating. In longer term positive upgrade is possible if strong GDP growth continues, unemployment starts declining and CA deficit continues declining, given that no shocks will come from other analysed factors.

## Conclusions

The paper focused on sovereign credit ratings given to Estonia and analysed their possible determinants. The first chapter gave an overview of different rating agencies and the methodology they use in rating. Also the interpretation, comparability and explanatory power of different ratings was analysed and the history of Estonian ratings discussed.

The second paragraph of the paper gave an overview of different economic factors that have been used as possible explainers of credit rating. From the analysis the following factors were concluded to be useful and informative for empirical analysis:

- GDP per capita and average real GDP growth;
- CPI inflation;
- REER growth;
- Fiscal balance and CA deficit as ratios to GDP;
- Net foreign debt ratio to exports;
- Unemployment rate;
- The correlation of RGDP growth to EU RGDP growth and the number of not opened, opened and closed chapters during the EU accession negotiations as measures of threshold level of economic development;
- The ratio of international reserves to import.

Empirical analysis using above-mentioned factors was carried out in three groups:

- Estonia and other transition countries
- Estonia and developed European countries
- Estonia and countries with similar ratings

The results of the analysis were also compared with the factors different rating agencies have pointed out in their reports. The analysis showed that the most critical constraints for Estonia that have to be emphasised in order to get possible rating upgrade in the future are nominal level of per capita GDP, high unemployment rate and high CA deficit. At the same time it should be looked after that other important indicators that have a strong relation with rating, but are at present at good levels (such as inflation, fiscal balance, foreign debt level and speed of transition and EU accession) do not get worse.

## References

1. **Bank for International Settlements. (1999)** A New Capital Adequacy Framework – Basel Committee on Banking Supervision Consultative Paper, June
2. **Bank for International Settlements. (2000)** Credit Ratings and Complimentary Sources of Credit Quality Information – Basel Committee on Banking Supervision Working Paper No 3, August
3. **Cantor, R., Packer, F. (1996)** Determinants and Impact of Sovereign Credit Ratings, Federal Bank of New York Economic Policy review, October, pp 37-54.
4. **Emerging Markets in the New Financial System. (1999)** p 176 – 214.
5. **Fitch:** Sovereign report: Estonia, October 2000.
6. **Haque, N. U., Kumar, M. S., Mark, N., Mathieson, D. J. (1996)** The Economic Content of Indicators of Developing Country Creditworthiness, IMF WP 96/9.
7. **Haque, N. U., Mark, N., Mathieson D. J. (1998)** The Relative Importance of Political and Economic Variables in Creditworthiness Ratings – IMF Working Paper No WP/98/46, April
8. **IMF, (1999)** International Capital Markets: Developments, Prospects, and Key Policy Issues, September [http://www.imf.org/external/pubs/ft/icm/1999/index.htm]
9. **IMF, (2000)** International Capital Markets: Developments, Prospects, and Key Policy Issues, September [http://www.imf.org/external/pubs/ft/icm/2000/01/eng/index.htm]
10. **Karacadag, C., Taylor M. T. (2000)** The New Capital Adequacy Framework: Institutional Constraints and Incentive Structures – IMF Working Paper No WP/00/93, June
11. **Monfort, B., Mulder, C. (2000)** Using Credit Ratings for Capital Requirements on Lending to Emerging Market Economies: Possible Impact of a New Basel Accord – IMF Working Paper No WP/00/69, March
12. **Moody’s Investors Services. (1995)** “Global Credit Analysis”, August
13. **Moody’s Investors Service. (1999a)** Moody’s Sovereign Ratings: A Ratings Guide – March
14. **Moody’s Investors Service. (1999b)** Bank Credit Risk In Emerging Markets – July
15. **Moody’s Investors Service (1999c)** Opening The Black Box: The Rating Committee Process At Moody’s – July
16. **Moody’s Investors Service. (2000)** Global Credit Research: Estonia, Nov. 2000.
17. **Moody’s** web page [http://www.moody.com], 21.08.2001
18. **Sabourin, P. (1999)** Analyzing and Forecasting Credit ratings: Some Canadian Evidence, Ministry of Finance of Canada WP 99-02
19. **Standard & Poor’s. (2000a)** Rating Performance 1999: Stability & Transition, February

20. **Standard & Poor's. (2000b)** Global News Briefs, November 13, 2000
21. **Standard and Poor's CreditWeek. (1997)** "Sovereign Credit Ratings: a Primer", April
22. **Standard & Poor's: Research: Estonia, Ratingsdirect Report, 23.01.2001.**
23. **Standard & Poor's** web page [<http://www.standardandpoors.com>], 21.08.2001
24. **The Economist (1999a)** "Capital Ideas", A Survey of International Banking, April 7 – 23, p. 12
25. **The Economist. (1999b)** "On Watch", May 15 – 21, pp. 90-91



### Appendix 1. Description of ratings (rating agencies Fitch, Standard & Poor's and Moody's)

Rating agency			Description of rating
Fitch	S & P	Moody's	
<b>Investment grade</b>			
AAA	AAA	Aaa	Highest creditworthiness
AA+	AA+	Aa1	High creditworthiness
AA	AA	Aa2	
AA-	AA-	Aa3	
A+	A+	A1	Strong ability to service its obligations
A	A	A2	
A-	A-	A3	
BBB+	BBB+	Baa1	Adequate ability to service its obligations
BBB	BBB	Baa2	
BBB-	BBB-	Baa3	
<b>Speculative grade</b>			
BB+	BB+	Ba1	The servicing of obligations is probable
BB	BB	Ba2	
BB-	BB-	Ba3	Indeterminable
B+	B+	B1	High risk obligations
B	B	B2	
B-	B-	B3	
<b>Default grade</b>			
CCC+	CCC+	Caa	High probability of default or the servicing of debts is already impaired
CCC	CCC		
CCC-	CCC-		
C	C	Ca	Bankrupt or the servicing of debts has stopped
DDD-D	D	D	

## Appendix 2. Group of transition and former socialist countries and their ratings

Country	Rating	Rater	Rating on numerical scale
Slovenia	A	Standard & Poor's	6
Czech Republic	A-	Standard & Poor's	7
Hungary	A-	Standard & Poor's	7
Estonia	BBB+	Standard & Poor's	8
Poland	BBB+	Standard & Poor's	8
Latvia	BBB	Standard & Poor's	9
China	BBB	Standard & Poor's	9
Croatia	BBB-	Standard & Poor's	10
Lithuania	BBB-	Standard & Poor's	10
Slovak Republic	BB+	Standard & Poor's	11
Kazakhstan	BB-	Standard & Poor's	13
Bulgaria	B+	Standard & Poor's	14
Azerbaijan	B+	Fitch	14
Mongolia	B	Standard & Poor's	15
Romania	B-	Standard & Poor's	16
Russia	B-	Standard & Poor's	16
Moldova	B-	Fitch	16

Data: Standard & Poor's, Fitch

### Appendix 3. Group of Estonia and developed European countries and their ratings

Country	Rating	Rater	Rating on numerical scale
Austria	AAA	Standard & Poor's	1
France	AAA	Standard & Poor's	1
Germany	AAA	Standard & Poor's	1
Luxembourg	AAA	Standard & Poor's	1
Netherlands	AAA	Standard & Poor's	1
Norway	AAA	Standard & Poor's	1
Switzerland	AAA	Standard & Poor's	1
United Kingdom	AAA	Standard & Poor's	1
Denmark	AAA	Standard & Poor's	1
Belgium	AA+	Standard & Poor's	2
Finland	AA+	Standard & Poor's	2
Ireland	AA+	Standard & Poor's	2
Spain	AA+	Standard & Poor's	2
Sweden	AA+	Standard & Poor's	2
Italy	AA	Standard & Poor's	3
Portugal	AA	Standard & Poor's	3
Iceland	A+	Standard & Poor's	5
Cyprus	A	Standard & Poor's	6
Greece	A	Standard & Poor's	6
Malta	A	Standard & Poor's	6
Israel	A-	Standard & Poor's	7
Estonia	BBB+	Standard & Poor's	8

Data: Standard & Poor's

#### Appendix 4. Group of Estonia and countries with similar ratings

Country	Rating	Rater	Rating on numerical scale
Iceland	A+	Standard & Poor's	5
Cyprus	A	Standard & Poor's	6
Hong Kong	A	Standard & Poor's	6
Malta	A	Standard & Poor's	6
Slovenia	A	Standard & Poor's	6
Greece	A	Standard & Poor's	6
Barbados	A-	Standard & Poor's	7
Chile	A-	Standard & Poor's	7
Czech Republic	A-	Standard & Poor's	7
Israel	A-	Standard & Poor's	7
Hungary	A-	Standard & Poor's	7
Estonia	BBB+	Standard & Poor's	8
Poland	BBB+	Standard & Poor's	8
China	BBB	Standard & Poor's	9
Korea	BBB	Standard & Poor's	9
Latvia	BBB	Standard & Poor's	9
Malaysia	BBB	Standard & Poor's	9
Qatar	BBB	Standard & Poor's	9
Tunisia	BBB	Standard & Poor's	9
Croatia	BBB-	Standard & Poor's	10
Egypt	BBB-	Standard & Poor's	10
Lithuania	BBB-	Standard & Poor's	10
South Africa	BBB-	Standard & Poor's	10
Thailand	BBB-	Standard & Poor's	10
Trinidad & Tobago	BBB-	Standard & Poor's	10
Uruguay	BBB-	Standard & Poor's	10

Data: Standard & Poor's

### Appendix 5. Relation between rating and different economic factors among Estonia and other transitional countries<sup>16</sup>

Country	Rating	Per capita GDP, USD	Average RGDP growth, 1997 – 2000, %	Average CPI inflation, 1997 – 2000, %	REER growth, 1997 – 2000, %	Fiscal balance ratio to GDP, 1997 - 2000, %
Slovenia	A	9771	4.4	8.8	2.5	-1.0
Czech Republic	A-	5201	0.8	6.3	5.9	-2.4
Hungary	A-	5303	4.1	13.0	1.5	-3.9
<b>Estonia</b>	<b>BBB+</b>	<b>3447</b>	<b>4.5</b>	<b>6.5</b>	<b>13.9</b>	<b>-1.3</b>
Poland	BBB+	4279	5.3	11.1	9.2	-2.9
Latvia	BBB	2620	1.2	4.5	NA	-2.0
China	BBB	860	7.9	0.2	NA	-3.0
Lithuania	BBB-	2989	3.0	3.9	NA	-4.5
Croatia	BBB-	4044	3.4	4.9	-0.4	-3.3
Slovak Republic	BB+	3557	3.6	8.8	NA	-3.3
Kazakhstan	BB-	1060	2.2	11.4	NA	-6
Bulgaria	B+	1463	0.9	98.6	17.0	-1.1
Azerbaijan	B+	500	8	-1.3	NA	NA
Mongolia	B	326.3	3.8	17.1	NA	-10.3
Romania	B-	1635	-3.5	71.3	21.2	-3.2
Russia	B-	1677	1.7	34.6	-30.0	-5.6
Moldova	B-	272.7	-3.4	21.9	3.9	NA

Country	Rating	CA balance ratio to GDP, 1997 - 2000, %	Debt ratio to exports, 2000, % <sup>17</sup>	Debt ratio to GDP, 2000, % <sup>16</sup>	Unemployment rate, 2000, %	Int. reserve coverage of imports, months, 2000
Slovenia	A	-2.0	-3.0	-1.8	12.2	2.9
Czech Republic	A-	-3.7	20.7	14.8	8.6	3.9
Hungary	A-	-3.8	27.0	NA	6.4	4.4
<b>Estonia</b>	<b>BBB+</b>	<b>-8.3</b>	<b>12.0</b>	<b>9.0</b>	<b>13.7</b>	<b>2</b>
Poland	BBB+	-5.2	55.0	23.2	14.0	5.7
Latvia	BBB	-8.7	16.0	7.0	8.4	3.1
China	BBB	2.1	-34.0	NA	7.6	8.6
Lithuania	BBB-	-10.6	42.0	17.5	11.5	2.5
Croatia	BBB-	-8.1	60.0	11.6	21.4	3.4
Slovak Republic	BB+	-6.6	24.0	12.4	18.0	3.3
Kazakhstan	BB-	-2.7	56.0	NA	6.4	3.3
Bulgaria	B+	-0.3	68.0	30.0	17.0	5.9
Azerbaijan	B+	-15.0	NA	NA	1.1	4.3
Mongolia	B	2.0	97.0	74.3	5.0	3.1
Romania	B-	-4.7	44.0	13.2	10.9	3
Russia	B-	0.0	100.0	45.8	11.3	2.3
Moldova	B-	-12.7	NA	NA	NA	4

<sup>16</sup> Data: EcoWin database, IMF IFS CD-ROM

<sup>17</sup> Data: EcoWin database, IMF IFS CD-ROM, Standard & Poor's. In the case of transition and not-European countries public sector debt was used as a proxy of government debt because of data availability

### Appendix 6. Relation between rating and different economic factors among Estonia and developed European countries<sup>18</sup>

Country	Rating	Per capita GDP, USD	Av. RGDP growth, 1997 – 2000, %	Av. CPI inflation, 97 – 00, %	REER growth, 97 – 00, %	Fiscal balance ratio to GDP, 97 - 00, %
Austria	AAA	24786	2.3	1.3	-4.5	-2.4
France	AAA	22873	2.4	1.0	-7.5	-2.6
Germany	AAA	24091	1.8	1.3	-8.1	-2.3
Luxembourg	AAA	44386	4.9	1.6	-0.8	2.9
Netherlands	AAA	24181	3.8	2.2	-3.9	-0.4
Norway	AAA	37421	2.7	2.6	-5.0	5.9
Switzerland	AAA	38714	1.7	0.7	-3.0	-1.3
United Kingdom	AAA	26562	2.6	2.8	9.5	-0.8
Denmark	AAA	34932	2.5	2.4	-3.1	-0.9
Belgium	AA+	23115	2.7	1.6	-5.3	-1.6
Finland	AA+	24231	4.9	1.8	-6.3	0.7
Ireland	AA+	26294	9.3	2.8	-10.3	1.6
Spain	AA+	14145	3.8	2.4	-3.3	-2.5
Sweden	AA+	27887	2.7	0.5	-7.7	0.2
Italy	AA	21816	1.7	2.1	-5.3	-3.2
Portugal	AA	10360	3.4	2.5	-2.7	-2.3
Iceland	A+	32651	4.8	3.0	7.3	0.4
Cyprus	A	12877	3.8	2.5	-3.5	-4.4
Greece	A	11107	3.2	4.0	NA	-3.3
Malta	A	9777	3.7	2.5	4.4	-8.8
Israel	A-	16834	2.8	5.2	0.7	-2.8
<b>Estonia</b>	<b>BBB+</b>	<b>3447</b>	<b>4.5</b>	<b>6.5</b>	<b>13.9</b>	<b>-1.3</b>

Country	Rating	CA balance ratio to GDP, 1997 - 2000, %	Debt ratio to exports, 2000, % <sup>19</sup>	Debt ratio to GDP, 2000, % <sup>18</sup>	Unemployment rate, 2000, %	Int. reserve coverage of imports, months, 2000
Austria	AAA	-2.4	128	62.8	3.7	2.7
France	AAA	2.3	202	58.0	9.7	1.7
Germany	AAA	-2.3	180	60.2	9.6	1.5
Luxembourg	AAA	NA	4	5.3	2.6	0.1
Netherlands	AAA	NA	84	56.3	2.6	0.7
Norway	AAA	2.3	68	26.5	2.7	4.1
Switzerland	AAA	10	-311	-140	2.0	5.3
United Kingdom	AAA	-0.3	66	42.9	5.5	0.8
Denmark	AAA	1.4	56	47.3	5.4	3.3
Belgium	AA+	NA	137	110.9	10.8	0.7
Finland	AA+	5.4	104	44.0	9.8	2
Ireland	AA+	NA	42	39.1	4.1	1.3
Spain	AA+	-1.0	203	60.6	9.3	2.3
Sweden	AA+	2.7	77	55.6	4.7	1.6
Italy	AA	NA	389	110.2	10.6	1.5
Portugal	AA	-6.6	171	53.8	4.0	3.2
Iceland	A+	-4.2	174	59.7	1.3	1.4
Cyprus	A	-4.4	-5	-2.2	10.4	5.4
Greece	A	-4.7	69	103.9	NA	6.6
Malta	A	-5.9	-49	-44.7	7.4	4
Israel	A-	-2.6	25	10.0	8.8	5.5
<b>Estonia</b>	<b>BBB+</b>	<b>-8.3</b>	<b>12</b>	<b>9.0</b>	<b>13.7</b>	<b>2</b>

<sup>18</sup> Data: EcoWin database, IMF IFS CD-ROM

<sup>19</sup> Data: EcoWin database, IMF IFS CD-ROM, Standard & Poor's. In the case of transition and not-European countries public sector debt was used as a proxy of government debt because of data availability

### Appendix 7. Relation between rating and different economic factors among Estonia and countries with similar ratings<sup>20</sup>

Country	Rating	Per capita GDP, USD	Average RGDP growth, 1997 – 2000, %	Average CPI inflation, 1997 – 2000, %	REER growth, 1997 – 2000, %	Fiscal balance ratio to GDP, 1997 – 2000, %	CA balance ratio to GDP, 1997 – 2000, %
Iceland	A+	<b>32651</b>	<b>4.8</b>	<b>3.0</b>	<b>7.3</b>	<b>0.4</b>	<b>-4.2</b>
Cyprus	A	12877	3.8	2.5	-3.5	-4.4	-4.4
Hong Kong	A	25354	2.5	1.9	NA	0.8	6.2
Malta	A	9777	3.7	2.5	4.4	-8.8	-5.9
Slovenia	A	9771	4.4	8.8	2.5	-1.0	-2.0
Greece	A	11107	3.2	4.0	NA	-3.3	-4.7
<b>A mean</b>		<b>13777</b>	<b>3.5</b>	<b>3.9</b>	<b>1.1</b>	<b>-3.3</b>	<b>-2.5</b>
<b>A median</b>		<b>11107</b>	<b>3.7</b>	<b>2.5</b>	<b>2.5</b>	<b>-3.3</b>	<b>-4.3</b>
Barbados	A-	10135	3.5	2.7	NA	-1.6	-3.2
Chile	A-	4675	4.6	4.6	-6.2	0.5	-3.0
Czech Republic	A-	5201	0.8	6.3	5.9	-2.4	-3.7
Israel	A-	16834	2.8	5.2	0.7	-2.8	-2.6
Hungary	A-	5303	4.1	13.0	1.5	-3.9	-3.8
<b>A- mean</b>		<b>8430</b>	<b>3.2</b>	<b>6.4</b>	<b>0.5</b>	<b>-2.0</b>	<b>-3.3</b>
<b>A- median</b>		<b>5303</b>	<b>3.5</b>	<b>5.2</b>	<b>1.1</b>	<b>-2.4</b>	<b>-3.2</b>
<b>Estonia</b>	<b>BBB+</b>	<b>3447</b>	<b>4.5</b>	<b>6.5</b>	<b>13.9</b>	<b>-1.3</b>	<b>-8.3</b>
Poland	BBB+	4279	5.3	11.1	9.2	-2.9	-5.2
<b>BBB+ mean</b>		<b>3863</b>	<b>4.9</b>	<b>8.8</b>	<b>11.6</b>	<b>-2.1</b>	<b>-6.8</b>
<b>BBB+ median</b>		<b>3863</b>	<b>4.9</b>	<b>8.8</b>	<b>11.6</b>	<b>-2.1</b>	<b>-6.8</b>
China	BBB	860	7.9	0.2	NA	-3.0	2.1
Korea	BBB	10086	4.6	3.8	NA	-2.8	5.7
Latvia	BBB	2620	1.2	4.5	NA	-2.0	-8.7
Malaysia	BBB	3685	5.0	3.6	-16.1	-0.1	8.1
Qatar	BBB	25075	3.1	2.5	NA	NA	-4.8
Tunisia	BBB	2126	5.7	3.1	0.3	-2.2	-2.9
<b>BBB mean</b>		<b>7408</b>	<b>4.6</b>	<b>2.9</b>	<b>-7.9</b>	<b>-2.0</b>	<b>-0.1</b>
<b>BBB median</b>		<b>3152</b>	<b>4.8</b>	<b>3.3</b>	<b>-7.9</b>	<b>-2.2</b>	<b>-0.4</b>
Croatia	BBB-	4044	3.4	4.9	-0.4	-3.3	-8.1
Egypt	BBB-	1359	5.4	3.6	NA	-2.2	-2.0
Lithuania	BBB-	2989	3.0	3.9	NA	-4.5	-10.6
South Africa	BBB-	3123	2.4	6.9	-16.1	-3.6	-1.0
Thailand	BBB-	2176	0.3	3.9	NA	-3.3	7.4
Trinidad & Tobago	BBB-	5319	3.4	4.2	12.6	-1.6	-10.6
Uruguay	BBB-	6017	2.4	10.3	6.0	-2.4	-2.1
<b>BBB- mean</b>		<b>3575</b>	<b>2.9</b>	<b>5.4</b>	<b>0.5</b>	<b>-3.0</b>	<b>-3.9</b>
<b>BBB- median</b>		<b>3123</b>	<b>3.0</b>	<b>4.2</b>	<b>2.8</b>	<b>-3.3</b>	<b>-2.1</b>

<sup>20</sup> Data: EcoWin database, IMF IFS CD-ROM

## Appendix 7 continues.

Country	Rating	Debt ratio to exports, 2000, % <sup>21</sup>	Debt ratio to GDP, 2000, % <sup>25</sup>	Unemployment rate, 2000, %	Int. reserve coverage of imports, months, 2000
Iceland	A+	<b>174.0</b>	<b>59.7</b>	<b>1.3</b>	<b>1.4</b>
Cyprus	A	-5.0	-2.2	10.4	5.4
Hong Kong	A	-51.0	-76.5	5.0	5.1
Malta	A	-49.0	-44.7	7.4	4.0
Slovenia	A	-3.0	-1.8	12.2	2.9
Greece	A	69.0	103.9	NA	6.6
<b>A mean</b>		<b>-7.8</b>	<b>-4.3</b>	<b>8.8</b>	<b>4.8</b>
<b>A median</b>		<b>-5.0</b>	<b>-2.2</b>	<b>8.9</b>	<b>5.1</b>
Barbados	A-	15.0	7.4	16.7	2.4
Chile	A-	34.0	9.9	9.2	7.7
Czech Republic	A-	20.7	14.8	8.6	3.9
Israel	A-	25.0	10.0	8.8	5.5
Hungary	A-	27.0	NA	6.4	4.4
<b>A- mean</b>		<b>24.3</b>	<b>10.5</b>	<b>9.9</b>	<b>4.8</b>
<b>A- median</b>		<b>25.0</b>	<b>10.0</b>	<b>8.8</b>	<b>4.4</b>
<b>Estonia</b>	<b>BBB+</b>	<b>12.0</b>	<b>9.0</b>	<b>13.7</b>	<b>2.0</b>
Poland	BBB+	55.0	23.2	14.0	5.7
<b>BBB+ mean</b>		<b>33.5</b>	<b>16.1</b>	<b>13.9</b>	<b>3.9</b>
<b>BBB+ median</b>		<b>33.5</b>	<b>16.1</b>	<b>13.9</b>	<b>3.9</b>
China	BBB	-34.0	NA	7.6	8.6
Korea	BBB	18.0	NA	6.3	6.1
Latvia	BBB	16.0	7.0	8.4	3.1
Malaysia	BBB	-1.0	-1.2	3.2	4.0
Qatar	BBB	84.0	37.3	NA	0.2
Tunisia	BBB	91.0	39.6	NA	2.6
<b>BBB mean</b>		<b>29.0</b>	<b>20.7</b>	<b>6.4</b>	<b>4.1</b>
<b>BBB median</b>		<b>17.0</b>	<b>22.1</b>	<b>6.9</b>	<b>3.6</b>
Croatia	BBB-	60.0	11.6	21.4	3.4
Egypt	BBB-	6.0	1.0	11.3	7.1
Lithuania	BBB-	42.0	17.5	11.5	2.5
South Africa	BBB-	61.0	17.7	5.4	2.6
Thailand	BBB-	19.0	10.9	3.6	6.7
Trinidad & Tobago	BBB-	18.0	8.7	14.2	3.2
Uruguay	BBB-	26.0	4.7	13.6	5.9
<b>BBB- mean</b>		<b>33.1</b>	<b>10.3</b>	<b>11.6</b>	<b>4.5</b>
<b>BBB- median</b>		<b>26.0</b>	<b>10.9</b>	<b>11.5</b>	<b>3.4</b>

<sup>21</sup> Data: EcoWin database, IMF IFS CD-ROM, Standard & Poor's. In the case of transition and not-European countries public sector debt was used as a proxy of government debt because of data availability



### Appendix 8. Relation between rating and threshold level of economic development

Estonian and CEE transition countries +Malta, Cyprus							
Country	Rating	Correlation of RGDP growth with EU average RGDP growth, 1996 - 2000	EBRD Transition index	Accession negotiations			
				Not opened	Opened	Closed	Points
Slovenia	A	0.53	3.3	1	9	20	19
Malta	A	NA	NA	10	4	16	6
Cyprus	A	NA	NA	1	8	21	20
Czech Republic	A-	-1.00	3.4	1	11	18	17
Hungary	A-	0.99	3.7	1	10	19	18
<b>Estonia</b>	<b>BBB+</b>	<b>0.04</b>	<b>3.5</b>	<b>1</b>	<b>10</b>	<b>19</b>	<b>18</b>
Poland	BBB+	-0.38	3.5	1	13	16	15
Latvia	BBB	0.13	3.1	4	13	13	9
Lithuania	BBB-	-0.14	3.1	9	6	15	6
Croatia	BBB-	3.0	NA	NA	NA	NA	NA
Slovak Republic	BB+	-0.52	3.3	6	8	16	10
Bulgaria	B+	0.82	2.9	15	6	9	-6
Romania	B-	-0.95	2.8	18	6	6	-12

Data: EBRD, EcoWin database, IMF IFS CD-ROM, Estonian Ministry of Foreign Affairs