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The Visegrád Group Countries' Ratings – Do the Credit Rating Agencies Make the Decisions Independently or Piggyback Themselves?

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Abstract

The paper addresses a few questions connected with actions taken by main CRAs in relation with ratings of Visegrad Group Countries. In particular it focuses on settlement: If all CRAs are independent or follow the opinions of their competitors, whether there is one leader that in case of all analyzed countries as the first one communicates change of its opinion or at least the frequency of being the leader in all countries is the biggest, if there is relation between the behavior of the respective credit rating agency and number of rating actions taken by this agency.

Keywords: Rating, Credit Rating Agency, Sovereign Debt, Visegrad Group, Piggybacking

JEL Classifications: F34, G01, G12, G14, G23

Introduction

The rating can be defined as a universal assessment system allowing the classification of credit risk on a national and international scale (Dziawgo 2010). The rating shall be treated as an opinion issued by an independent, external, professional agency about the credit risk of a given entity or its debt instruments. The agencies communicate their judgments and opinions through market-based ratings, which are grounded on a professional analysis affected by a wide range of available information. They reduce the problem of information asymmetry on financial markets. They also make it easier for issuers to raise capital and support investors in the process of making investment decisions. Their unquestionable advantage is versatility and simplicity. A single, concise, communicative and quite commonly understood alphanumeric code is assigned to all significant elements of the credit risk associated with a given entity or issued financial instruments (Korzeb, Kulpaka, Niedziółka 2018).

The origin of the leading rating agencies dates back to the 19th century. The market of rating agencies took the form of a market structure called oligopoly in the first half of the 20th century and nowadays is dominated by "Big Three," i.e., Standard&Poor's, Moody's and Fitch Ratings which altogether account for more than 95% market

share. The most important reasons for such a high concentration were significant entry barriers, low recognition of the so-called small rating agencies, supervisory and licensing policies in the United States as well as numerous mergers and acquisitions. Although the global financial crisis of 2007-2009 was not the first before which the agencies did not correct their rather optimistic assessments, their impact on the financial markets has not been limited in the post-crisis period. This applies in particular to Anglo-Saxon markets, where institutional investors seeking high diversification of portfolios are not able to replace ratings with the results of their own analyzes. The impact of credit rating agencies on financial markets is still extremely important since ratings reductions (or even changes in the outlooks), which sometimes are massive, may determine the forced sale of assets, thus affecting the decline in their prices, as well as creating problems related to obtaining financing. The largest rating agencies have been using the business model since the 1970s, in which the issuer pays for the rating. This potential source of conflict of interest together with the mentioned influence of the three leading rating agencies on investors' decisions and market conditions, make rating agencies institutions of major importance for the stability of the financial system.

Sovereign credit ratings strengthen transparency and contribute to the reduction of information asymmetry and therefore, attract inflow of foreign capital (Kaminsky, Schmukler 2002). Sovereign debt ratings, which seem to be the benchmarks for other types of external ratings, differ substantially from corporate ones. The main discrepancies are the following:

- States do not pay for ratings— therefore, conflict of interest, in fact, does not exist in this field, and these unsolicited assessments cannot be treated as inflated. One has to add that the attitude of securities regulators evolved over last 15-20 years since in the past the regulatory bodies discouraged market participants from unsolicited ratings because with them there was bound an attempt to extort and force payment of rating fee upon due diligence if ordered by the entity willing to improve its rating. So the unsolicited ratings were considered as underestimated whereas now solicited ones due to rating shopping and significantly higher levels are regarded as less reliable (Sangiorgi, Spatt 2017, p. 8),
- Usually, sovereign debt is rated by all main credit agencies, and that is why one cannot consider rating shopping (the cases of sovereign debt ratings' withdrawals are very rare and refer to small peripheral economies),
- Due to rating ceiling credit ratings granted to sovereigns play crucial role not only from the perspective of sovereign issuers but also from corporate issuers' point of view,
- Bonds issued by states are designed in a very simple way (no collateral, covenants, embedded options, issues differing from each other only by maturities, frequencies of coupon payment or way of interest calculation). Moreover, the data used by credit rating agencies, at least quantitative data, is commonly available without additional cost. Having this in mind as well as at least main assumptions of rating methodology it shall be rather easy to check the correctness of PD's calculation somehow reflected in the rating,
- Bankruptcy of state is much less probable than a corporate issuer.

This paper addresses a few questions connected with actions taken by main credit ratings agencies in relation with sovereign ratings of Visegrad Group Countries ("VGC"). In particular, it focuses on settlement:

- If all CRAs are independent or follow the opinions of their competitors,
- Whether there is one leader that in case of all analyzed countries as the first one communicates change of its opinion (in a form of rating action) on creditworthiness of the respective state treasury or at least the frequency of being the leader in all countries is the biggest,
- If there is relation between the behavior of the respective credit rating agency (leader or follower) and number of rating actions taken by this agency.

On one hand, the methodologies applied by CRAs to assign and thereafter update credit ratings for sovereigns seem to be similar in terms of scope of fields influencing the rating. On the other hand, the weights are different, as well as some determinants are qualitative and subjective. Moreover, CRAs reserve themselves the right to adjust the model output (partially based on subjectively chosen assumptions). For instance, Fitch Ratings employs so called Qualitative Overlay justifying that no model can fully capture all the relevant influences on sovereign credit worthiness. The QO allows the adjustment of +/- 2 notches for each of the four analytical pillars and overall

notching adjustment ranges of +/-3 notches (Fitch Rating 2018). Since the rating criteria for sovereigns are unclear apart from studies aimed at extraction and assessment of strength of some quantitative variables affecting the final rating, one has to take into consideration factors that are not measurable. This study focuses on one of them assuming that fact (if confirmed) of equaling the rating to the one granted by another CRA is frequenter in case of some agencies than of others. Such a remark would authorize to conclude that also action of competitor is taken into account while granting the final opinion.

The study indirectly addresses also the problem of differences in quality of rating processes applied for developed and emerging market countries. Rating agencies represent quite good track record as regards developed countries but not satisfactory in emerging economies which results from underinvestment in gathering necessary information. CRAs invest not enough in assessing the credit worthiness of issuers (also sovereign) in less developed countries, and the distortion of the assessment could prove an obstacle to less developed countries as regards access to external funding. Ratings agencies can afford such unfair treatment because of rent extraction, low risk that issuers from emerging market would complain about acute assessment as well as due to the fact that conservative approach reduces potential accusation of too late downgrading (Ferri 2004).

The VGC were chosen since these countries are characterized by similar history, geopolitical location, and experienced analogous transformation process.

Literature review

The topic of this research is connected in fact with two issues: independence of rating agencies and determinants of sovereign ratings. That is why there was executed the literature query in both streams, focusing mainly on working papers devoted to ratings granted to emerging market countries called also LDC (Less Developed Countries).

Since the same information on main macroeconomic data at the same time reach Credit Rating Agencies, and other stakeholders and CRAs are not in the possession of additional information, it is understandable that sovereign ratings' decision rather follow than lead market. This situation shows the dilemma that CRAs face. On one hand they are accused for lack of reaction to market signals, on the other hand, the market expects the rating are stable and through-the-cycle. That is why the direction of changes of ratings seems to be in line with market reactions to some newly published data however, the strength of CRAs' action is biased. The announced ratings are exposed to typical forecasting errors like pro-cyclicality, underestimation of changes, and incapacity to deal with shocks (Tichy 2011).

CRAs' services may reduce information asymmetry between an issuer and investors since rating agencies use not only public information but also (or even mainly) sensitive and confidential data. In this context, one should point out the importance of credit rating agencies. Without such a form of intermediary issuers at the same time will not be able to keep in secret the sensitive data (e.g., having potentially positive impact on their performance however their disclosure cannot take place due to commercial reasons) and convince the potential investors they will be able to service newly issued debt. It depends on CRA's independence, competences, quality of methodology as well as professionalism whether the inside information is exactly reflected by the rating. The emergence of the subprime crisis eroded the reputation capital of rating agencies, and therefore, each of the factors affecting the way of transformation of internal confident information into rating became subject of detailed investigation. If it is relatively easy to verify the correctness of the models' formulas, it is rather tough to examine whether the assumptions were defined objectively or they were tuned to the expected and desirable ones. That's is why the independence and objectivism are crucial as regards the activity of credit rating agency.

The question of independence of CRAs appeared again following subprime mortgage crisis (in the context of damage of reputation of CRAs). On the other hand announcements of potential or actual downgrades of government bonds issued by U.S. and other most developed economies governments bonds were considered by market participants as steps forward redeeming the biggest credit rating agencies (Mohindra 2019). The independence, however very often references to analysts and issuers. As regards analysts their remuneration cannot

be a function of agency's revenues or profit as well as an obligatory rotation of analysts' teams dedicated to a specific issuer guarantee their independence. It is considered that CRAs characterized by the conflict of interest caused by "issuer paid" business model (existing in case of solicited ratings) contributed to pushing the global financial system to the crisis (Ryan 2012, pp. 3, 10). The proposed alleviation, in this case, seems to be *inter alia* transparency of the process, prohibition of consulting services on financial instruments to be rated and strengthening of quality of information and algorithms applied by CRAs. All the above mentioned solutions aimed at improvement of rating's quality were worked out on the basis of IOSCO principles published before the subprime crisis, then adjusted accordingly and finally implemented in UE and USA legislation (Gennari, Bosetti 2011). An interesting mechanism the application of which shall improve the quality of ratings granted by CRAs operating in issuer-paid business model was proposed by Bongaerts (2014, p. 3). The conclusions formulated in the above mentioned working paper point out that the optimal from social point of view solution seems to be a monopolistic CRA with large mandatory co-investments, i.e., obliged to invest substantial amounts into rated assets.

Another issue affecting the independence of credit rating agency refers to the scope and weight of factor influencing rating that are non-quantifiable and result in fact from subjective assessment. In case of sovereign ratings, such aspects are taken into consideration like independent press, separation of power, civil institutions, legally enforceable property rights or compliance with the rule of law. Undoubtedly they are crucial however, it is very hard to compare them across the countries. Also, some types of democracies or models of market economy are preferred by specific rating agencies which makes sovereign rating not fully comparable (Brunner, Abdelal 2005, p. 199)

The independence of credit rating agency is tested in case of significant and/or unexpected by the market downgrades of country ratings. The main CRAs suffering from deprivation of reputation during the subprime crisis tend to be more conservative and consistent regarding country rating during the sovereign crisis. Even such economies like United States or France did not avoid such actions. The downgrades were accompanied with complains expressed by governments, accusations toward rating agencies that their methodologies were incorrect.

The competition among credit rating agencies has not pushed them to differentiate methodologies. Moreover, the agencies apply credit worthiness assessment models based in fact on the same philosophy and assumptions. The competition has not forced them to reframe credit risk quantification methods into open system of thought, and instead of that they still quantify the risk by use of probability distributions which have to be stable to generate comparable results. The progressive unification of approaches puts into question the issue of independence of CRAs as regards the construction of algorithms, especially having in mind pro-cyclicality of currently used models and their assumptions reflecting, in fact, inherent stability (Schroeder 2015, p. 8). Although there are some initiatives aiming a strengthening of the competition on credit rating market (creation of net of small state-owned CRAs or regulatory preferences for small CRAs) and some other agencies lay the claim to be a global player (like Chinese Dagong) it will take time to convince ratings users that above mentioned alternatives represent the comparable competences to Big Three despite the fact that Dagong's sovereign ratings methodology seems to be more conservative (Gaillard 2012) and reasonable as regards, for instance, the impact on sovereigns' creditworthiness the relation between dynamics of government debt and economy's output or fiscal revenues.

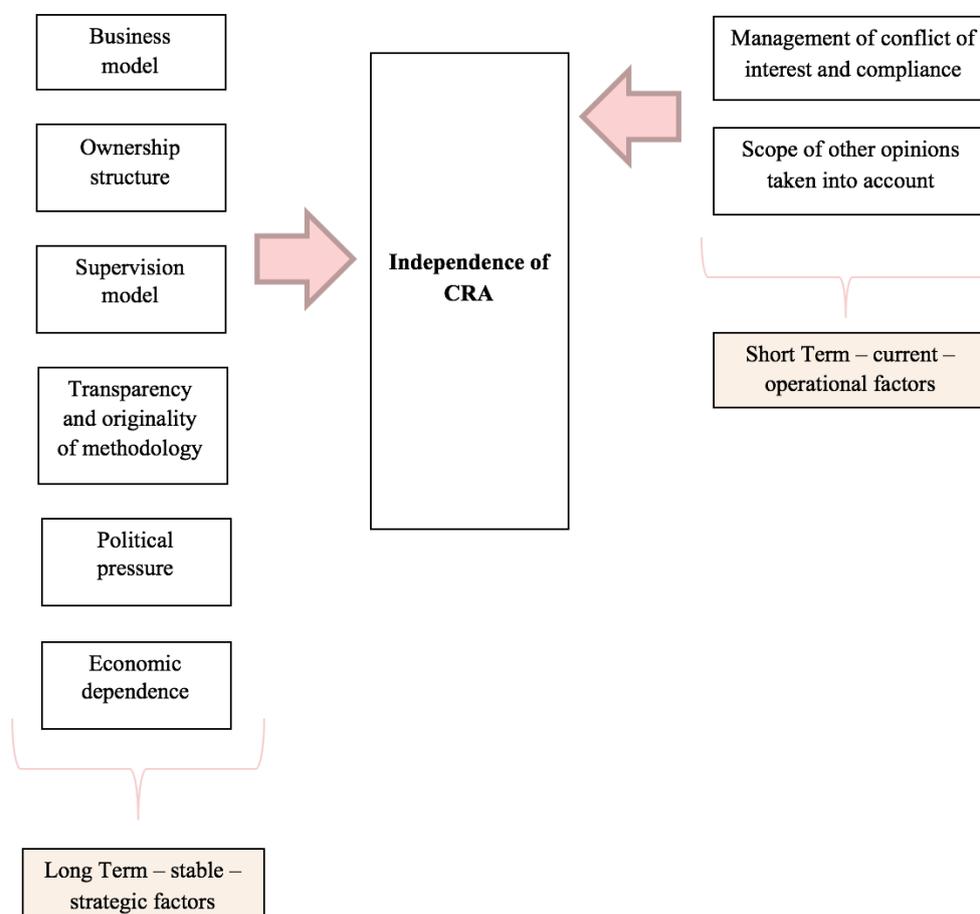
As regards economic independence, it refers to widely discussed in the marketing literature problem of value of the customer. In the simplest way, it can be identified with amount of anticipated revenues the rating agency generates from the co-operation with the client. Another issue is the concentration of clients in defined fields of activity estimated by share of revenues representing by the specific client or group of economically related entities. For the time being the practice of regulators focuses on the requirement to disclose the biggest clients (both related and non-related ones) as a list of Top 20 or all that account for more than 5% of agency revenues. Worth mentioning is also the concept of European Commission from 2008 that aims at identification of all clients having clearly higher than average contribution to the growth rate of CRA's revenues. There are not any administratively set limits of concentration; however, CRAs characterized by excessive dependence on a few clients can be subject of respective supervisory intervention (Matarocci 2014, pp. 108 – 109). The concentration's measurement can be

also carried out by more complex; however, widely used measures like HHI or Concentration Ratio (Avila, Flores, Lopez –Gallo, Marquez 2013).

One of the crucial questions that has to be asked refers to reasons that credit ratings agencies take into consideration the ratings granted by their competitors. Gomes (2015) argues that piggybacking, understood as weighing assessments of other CRAs while making the rating decision, allows to improve the precision of the rating being subject of resolution as well as decreases the cost of monitoring. Having permanently lower ratings than competitors in case of solicited credit ratings would affect diminishing interest from issuers. This, however, is not the case as regards sovereign ratings which are not paid by states. Analyzing sovereign debt ratings the author proves that probability of rating change is determined by difference between the current rating given by the agency making the decision on possible change or maintenance and ratings confirmed by other important agencies. Therefore rating changes can be predicted by the above mentioned differential. Another conclusion from averaging the assessments indicates diminishing informational value of rating as such since users of ratings (policymakers, investors as well as issuers) are not aware that true CRA's risk estimation is not reflected by the rating. Due to this simple making, the competition among CRAs fiercer will not contribute to improvement of quality of ratings. At the same time, Gomes confirms that interdependence between ratings goes beyond fundamentals. As investigated by Bhatia (2002, p. 45) "...the concept of piggybacking does not necessarily explain the upside bias in sovereign credit ratings, but may help to explain herd behavior." In view of the above mentioned opinion credit rating agencies follow not only their competitors' assessments but free ride on analyses of IMF, international banks, and other institutions engaged in sovereign debt performance.

The summary of the review of literature dedicated to the independence of credit rating agencies can therefore, illustrated by scope of factors affecting it:

Chart 1: Determinants of CRA's independence



Source: Own elaboration

Another issue albeit closely related to the problem of independency refers to determinants of CRAs' decisions. As far as the scope of factors affecting credit ratings is concerned, there have been carried out a lot studies based on different samples, time spans and by use of various methodologies. The initial investigations were dedicated to measurement of strength of impact on rating of some quantitative macroeconomic variables. Before the crisis of 2007-2009 out of qualitative variables taken into consideration only default history and economic development appeared in the role potential statistically significant determinants of sovereign credit rating.

Cantor and Packer (1996) in the preliminary study devoted to the issue of sovereign ratings' determinants considered eight economic variables as factors affecting sovereign ratings granted by Moody's and Standard & Poor's. Finally, using the multiple regression method out of these potential determinants six turned out to significant ones: GDP per capita, GDP growth, inflation, external debt, the economic development, and default history. The researchers found that leading rating agencies used similar weightages while assessing creditworthiness. Afonso (2003) using the least squares method with cross-sectional data carried out similar study on the sample of 81 countries (29 developed countries, 52 developing countries) in 2002. The results did not differ substantially from conclusions drawn by Cantor and Packer.

Rowland (2004) estimated the economic variables that determined the sovereign credit ratings and creditworthiness in July 2003 by using the least squares method with the help of data from 49 developing countries rated B- and higher. According to Rowland, GDP per capita, GDP growth rate, inflation rate, debt ratios (debt/GDP and debt/exports), debt service ratio (debt service/GDP), international reserves and openness of the economy (export/GDP) are determinants of credit rating and creditworthiness.

Afonso, Gomes, and Rother (2011) analysed the short-and-long term determinants of sovereign ratings from three main rating agencies, for the period 1995-2005 by using linear and ordered response models. They conclude that change in GDP per capita, GDP growth, government debt, and government balance have impact on sovereign credit ratings in short-term while government effectiveness, external debt, foreign reserves, and default history are long-term determinants.

Cantor and Packer (1996) pointed also out that decisions on sovereign ratings granted by the biggest rating agencies tend to move in lockstep. They proved very high correlation for Standard&Poor's and Fitch Ratings for downgrading of Greece and Spain as well as between Moody's and Standard&Poor's as regards reductions of ratings of Ireland and Portugal. It was then confirmed by Tichy (2011) who came to the conclusion that after 15 years that passed from Cantor's and Packer's research the list of macroeconomic factors influencing sovereign ratings of so called PIGS was subject to extension. Moreover, a significant part of rating's level could not be explained by quantitative fundamental determinants. Nonetheless, Tichy abandoned the identification of factors other than macroeconomic ones, default history, and economic development, which resulted in lack of explanation from 9% even up to 45% of the rating content.

Table 1: Determinants of downgrading of ratings for Greece, Ireland, Portugal, and Spain after Global Financial Crisis ("GFC")

Justification for downgrading	Cantor/Packer	Greece	Ireland	Portugal	Spain
GDP per capita	X	-	-	-	-
Inflation	X		-	-	-
External debt	X	10%	5%	6%	-
Economic development	X	-	-	-	-
Default history	X	-	-	-	-
GDP growth	-	7%	14%	24%	25%
Fiscal balance	-	7%	10%	29%	25%

Support financial sector	-	-	52%	-	25%
External balance	-	-	-	5%	-
EU-IMF programme	-	31%	-	-	-
Austerity programme	-	-	10%	18%	-
Other	-	45%	9%	18%	25%
Total		100%	100%	100%	100%

Source: Tichy G., Did Rating Agencies Boost the Financial Crisis? [in]: Lannoo K., Tichy G., ap Gwilym O., Msciandaro D., Paudyn B., Alsakka R. (2011): Credit Rating Agencies: Part of the Solution or Part of the Problem, *Intereconomics*, Volume 46, September/October, Number 5, p. 243.

The similarity of approaches applied by CRAs in the process of granting sovereign ratings was confirmed also in other studies. Sehgal, Mathur, Arora, and Gupta (2018, pp. 158-159) observed that despite using different models the majority of determinants of sovereign ratings are common for all main credit rating agencies, however agencies use different weightage to specific factors:

Table 2: Significant determinants of sovereign ratings

	Standard & Poor's	Moody's	Fitch Ratings
Governance indicators	X	X	X
Inflation	X	X	X
GDP per capita		X	X
GDP growth		X	X
International reserves	X		X
FDI	X		X

Source: Own elaboration based on: Sehgal S, Mathur S., Arora M., Gupta L. (2018): Sovereign ratings: Determinants and policy implications for India, *IIMB Management Review* 30

The above mentioned authors tried also to answer the question regarding the most reliable rating model and found Moody's the credit rating agency that has a higher percentage of correct predictions than its competitors.

Reusens and Croux (2017) used the sample of 90 countries and their ratings in the time period between 2002 and 2015 and came to the conclusion that after 2009 when the European debt crisis appeared the meaning of the financial balance, the economic development and the external debt increased substantially. Additionally, GDP growth became more important for highly indebted sovereigns as well as government debt affected materially the ratings of countries with a low GDP growth rate. The study carried out by Reusens and Croux confirmed that credit rating agencies changed their methodologies after the commence of the European debt crisis.

The review of studies dedicated to settlement of the list of determinants of sovereign ratings allows statement that despite dissimilar results (caused by different samples, methodologies and analysed periods) in case of developed countries it is feasible to justify a large portion of the rating by use of macroeconomic variables. Moreover, the strength and direction of influence is stable. This conclusion is not appropriate for emerging markets. In case of LDC, especially characterised by low income and instable political environment, it is tough to point out specific stable variables affecting the rating. This was proved inter alia in the study carried out by Pretorius and Botha (2017, pp. 560-561) who investigated African countries classified into low, lower middle, and upper middle income categories. Only in case of low- and upper-middle classes, the significance of the variables typically identified as main determinants of sovereign ratings (fundamental and macroeconomic ones) were confirmed. This was in line with results achieved by Erdem and Varlı (2014) who also explored the problem of determinants of ratings granted to countries counted to emerging markets however not dividing them into samples according to GDP or economic development criteria. They found budget balance/GDP, GDP per capita, governance indicators, and reserves/GDP the most important factors influencing ratings. Probably the conclusions will not be so unequivocal if the above mentioned differentiation is applied. Analyzing 105 countries rated by Standard & Poor's by use of Econometric Analysis of Panel Data also Yildiz and Günsoy (2017) came to the conclusion that not all

countries are assessed on the basis of the same criteria. That is why, based on income differentiator, they were divided into 3 groups. The main determinants turned out to be:

- for high income countries: GDP per capita, inflation, unemployment and government debt,
- for low and medium income countries: GDP per capita, GDP growth rate, inflation, unemployment, budget balance, current account balance, and government debt.

As it was mentioned vast majority of studies dedicated to identification of factors affecting sovereign credit ratings focuses on fundamental ones. Except for indicators reflecting level of economic development and default track record relatively seldom, other qualitative variables are verified. One of the first studies resulting in confirmation of role of political and social aspects was carried by Bissoondoyal-Bheenick (2005) who employed ordered response model on the basis of 95 countries between 1995 and 1999 rated by Standard & Poor's and Moody's and division the ratings into four categories (local currency, foreign currency, bonds and bank deposits ones). The important finding from the above mentioned study is that economic and financial variables are not sufficient to explain credit ratings, as well as strength of relationship between economic indicators and rating, depends on grading level. This, in fact, means that the set of variables and their weightages vary for different categories of countries. Political stability, voice of people, corruption control, government's effectiveness, regulatory quality were also identified by Butler and Fauver (2006) as significant determinants of sovereign ratings. This was confirmed by Chee, Fah and Nassir (2015) who analysed 53 countries in the period between 2000 and 2011 and found economic freedom (besides identified in earlier studies other qualitative variables like default history and economic development indicator) as a material factor having impact on credit rating. The similar results achieved Kabadayi and Celik (2015) who investigated 19 emerging countries based on data from World Bank, IMF, Heritage Foundation and CRA websites (standard & Poor's, Moody's Fitch Ratings) for the period between 1993 and 2009. They chose both macroeconomic and political variables as potential determinants of sovereign ratings. Using ordered panel probit and logit analysis they found the following factors statistically significant: (i) having negative effects: external debt, inflation, current account deficit, real exchange rate, (ii) having positive effects: GDP per capita, ratio of gross domestic savings/GDP and freedom index.

The first symptoms of GFC and initially its possible and shortly afterwards actual transformation into sovereign debt crisis in line with relatively abrupt or impulsive decisions of Big Three caused questions whether fundamentals are the only determinants of ratings or the only important variables. Pressure on CRAs to reveal at least general frames of the methodologies became a trigger for widening a list of investigated factors. Analysis of 86 ratings of countries executed by Butler and Fauver (2006) confirmed that apart from factors identified *inter alia* by Afonso (2002 and 2003) the country's legal and political institutions played an important role as ones determining ratings. The authors constructed an index reflecting legal and political institutions and came to above mentioned conclusions controlling the fundamental and macroeconomic variables, which proved the relation was properly extracted.

After the GFC the literature concerning CRAs' drivers in the process of granting sovereign ratings concentrates on macroeconomic and public finance fundamentals as well as on judgements of credit rating agencies. The authors of studies within this scope try to answer the question how important is real impact of fundamentals on ratings if it is stable over the time and whether this factor plays comparable role across countries and regions. The researches focused on deviation of actual ratings from model predicted ones as well as on finding some generalized rules governing the decisions of CRAs. Out of studies of this kind, the research conducted by Lennkh and Moshammer (2018) is especially worth indicating. The above mentioned authors used Moody's methodology to study the sovereign ratings of 74 countries from 2003 to 2016, dividing rating drivers into fundamental and judgement component. The results show that:

- Sovereign ratings for Latin America and Africa were on average 2-3 notches below scorecard-implied ones whereas Anglo-Saxon sovereigns exceeded their scorecard-implied rating by 1-2 notches,
- Actual ratings of higher (lower) rated sovereigns are higher (lower) than ones calculating based on the model,
- Negative fundamental developments contemporaneously determine rating downgrades whereas negative judgement in the previous year increases the likelihood of upgrade (therefore not only contemporaneous evolution of fundamentals but also previous negative judgement affects upgrades),

- Out of 29 explanatory variables, the judgement is best explained through government bond yields, real GDP growth the debt trend and interest payments relative to revenues.

The summary of results of studies dedicated to the identification of quantitative and qualitative factors influencing level of sovereign ratings is presented in Tables 3 and 4, respectively.

Table 3: Quantitative and qualitative determinants of sovereign ratings (1)

	Cantor, Packer (1996)	Afonso (2003)	Canuto, Dos Santos, Porto (2012)	Bissoondoyal-Bheenick	Butler, Fauver (2006)	Mellios, Paget-Blanc (2006)	Afonso, Gomes, Rother (2011)
Quantitative determinants							
GDP growth	X	X	X				X
Output growth							
GDP per capita	X	X	X	X		X	X
Inflation	X	X	X	X		X	
Money supply/GDP							
Investment/GDP							
Total debt/export							
Fiscal balance or Fiscal balance/GDP							
External debt	X	X					X
External debt/Total fiscal receipts ratio			X				
Government income						X	
Government debt							X
Real FX rate						X	
External reserves or Reserves/GDP							X
External balance							
Gross Domestic Savings/GDP							
Export/GDP							
Debt service/GDP							
Qualitative determinants							
Economic development	X	X					
Default history	X	X	X			X	X
Commercial openness			X				
Political indicator				X	X		
Legal institutions and regulatory quality					X		
Government effectiveness					X		X
Social indicator				X			
Corruption index					X	X	
Internet users							
Economical Freedom/Freedom Index							

Source: Own elaboration based on quoted studies

Table 4: Quantitative and qualitative determinants of sovereign ratings (2)

	Rowland (2004)	Pretorius, Botha (2014)	Pretorius M., Botha I. (2017)	Chee, Fah, Nassir (2015)	Mulder, Perrelli (2001)	Erdem, Varli (2014)	Kabadayi, Celik (2015)
Quantitative determinants							
GDP growth	X	X					
Output growth					X		
GDP per capita	X		X			X	X
Inflation	X	X		X	X		X
Money supply/GDP				X			
Investment/GDP					X		
Total debt/export	X				X		
Fiscal balance or Fiscal balance/GDP					X	X	X
External debt				X			X
External debt/Total fiscal receipts ratio							
Government income							
Government debt							
Real FX rate				X			X
External reserves or Reserves/GDP	X	X		X		X	
External balance		X					
Gross Domestic Savings/GDP							X
Export/GDP	X			X			
Debt service/GDP							
Qualitative determinants							
Economic development							
Default history				X	X		
Commercial openness							
Political indicator							
Legal institutions and regulatory quality			X			X	
Government effectiveness							
Social indicator							
Corruption index		X	X				
Internet users			X				
Economical Freedom/Freedom Index				X (as the first)			X

Source: Own elaboration based on quoted studies

Finally one can state that the knowledge of factors determining sovereign ratings seems to essential for policymakers and governments that would pay more attention to some hitherto treated variables, not as a priority (Sehgal, Mathur, Arora and Gupta 2018, p. 159).

Data and methodology

The research is based on aggregated and unified data referring to sovereign LT ratings in foreign currencies available on the website <http://www.worldgovernmentbonds.com>. The above mentioned information was randomly counterchecked with source data available on websites of so called Big Three (Standard& Poor's Global Ratings (<https://www.standardandpoors.com>), Moody's Corporation (<https://www.moody.com>) and Fitch Ratings (<https://www.fitchratings.com/site/home>). The choice of Big Three is justified by the fact that no other credit rating agency has monitored all Visegrad Group countries within the approx. 20 year period. There were taken into consideration all rating actions toward Visegrad Group countries within the period between the first rating action in case of:

- Czech Republic - 10 March 1993,
- Hungary – 18 July 1989,
- Poland – 1 June 1995,
- Slovakia – 15 February 1994 and November 2018.

As a “rating action” one should understand:

- Change of rating,
- Change of rating outlook (announcement of positive or negative outlook and withdrawal of positive or negative outlook).

During the analyzed period there were taken 166 rating actions, out of which in case of:

- Czech Republic – 24,
- Hungary – 63,
- Poland – 32,
- Slovakia – 47.

The ratings were subject to comparison according to the following matrix:

Table 5: LT Rating comparison (Standard&Poor's, Moody's, Fitch Ratings)

Description	S&P	Moody's	Fitch	DBRS	Grade
Prime	AAA	Aaa	AAA	AAA	Investment
High Medium Grade	AA+	Aa1	AA+	AA(high)	
	AA	Aa2	AA	AA	
	AA-	Aa3	AA-	AA(low)	
Upper Medium Grade	A+	A1	A+	A(high)	
	A	A2	A	A	
	A-	A3	A-	A(low)	
Lower Medium Grade	BBB+	Baa1	BBB+	BBB(high)	
	BBB	Baa2	BBB	BBB	
	BBB-	Baa3	BBB-	BBB(low)	
Speculative	BB+	Ba1	BB+	BB(high)	Speculative
	BB	Ba2	BB	BB	
	BB-	Ba3	BB-	BB(low)	
Highly Speculative	B+	B1	B+	B(high)	

	B	B2	B	B
	B-	B3	B-	B(low)
Substantial Risk	CCC+	Caa1	CCC+	CCC(high)
	CCC	Caa2	CCC	CCC
	CCC-	Caa3	CCC-	CCC(low)
Extremely Speculative	CC	Ca	CC	CC
	C	Ca	C	C
In Default	RD	C	RD	RD
	SD	/	SD	SD
	D	/	D	D

Source: <https://www.moneyland.ch/en/rating-agencies> (05.12.2018)

Rating actions were classified as ‘positive’ (rating upgrade, change from negative outlook into stable one or from stable into positive) and ‘negative’ (rating downgrade, change from positive outlook into stable one or from stable into negative). The next step was to settle a time of reaction of CRA to the decision of other rating agency. There were taken into consideration 3 scenarios:

- 1) The decision within up to 3 months from the date of the decision of other CRA was subject to assessment,
- 2) The decision within up to 6 months from the date of the decision of other CRA was subject to assessment,
- 3) Each first decision after the decision of other CRA (no matter how long after the decision of other credit rating agency) was taken into account.

Each rating action was evaluated. In case of scenarios 1 and 2, if the decision followed the action of the other credit rating agency, the follower received negative point. If the decision meant change of the direction of rating evaluation or was made within the following (next) time span, the CRA received the positive point. One should assume in fact, two possibilities:

- Analyzing a specific entity or issue a defined credit rating agency takes into consideration the results of assessment carried out by its competitor, however that one that bases on the same info package which is the base for conclusions to be drawn by the respective CRA while granting (renewing) rating or outlook. Having in mind such an assumption, one should settle the time span within which the rating agency can rely on its competitor decision. In this research, there were chosen two time windows: 3 and 6 months,
- Before the decision concerning rating or outlook, the credit rating agency takes into consideration both the latest decisions of its competitors in the sense of direction as well as level of ratings given by other CRAs. This approach is covered by the scenario 3.

The advantages and disadvantages of approaches reflected by specified scenarios are outlined in the Table 6:

Table 6: Advantages and disadvantages of methods of identification a herding behavior of credit rating agencies applied in the research

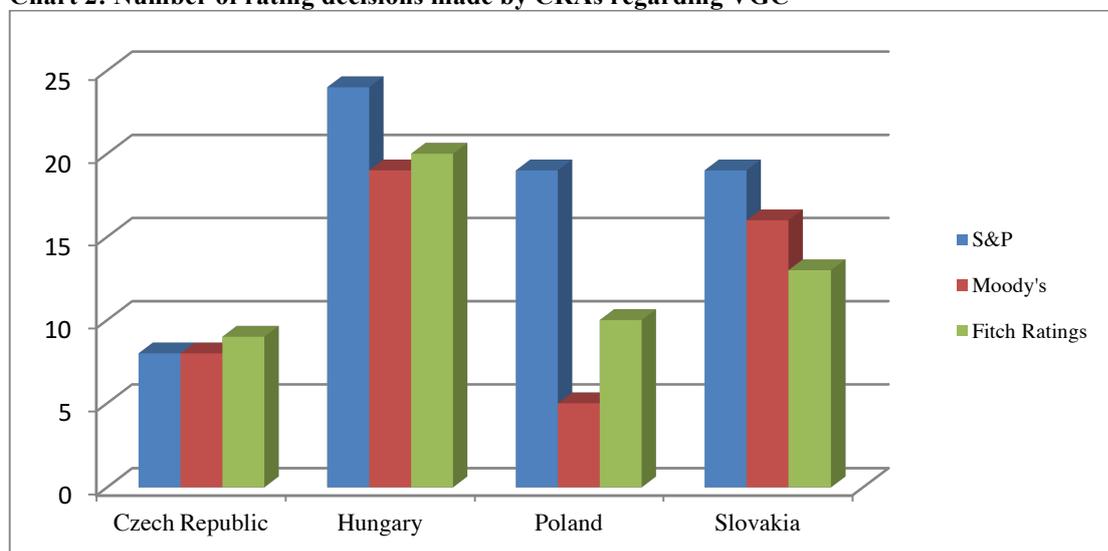
	Advantages	Disadvantages
3/6 month time span	<ol style="list-style-type: none"> 1. Defined maximum time a reaction – assumption that a decision of a specific CRA is a reaction to a competitor’ decision 2. Within the time span decisions are made on the same info package (at least macroeconomic variables) 	Any decision made even a few days after the lapse of the time span treated as independent
No time span (the latest rating decision of the competitor as a benchmark)	"Lookback" approach applied, i.e., assumption that making rating decision CRA takes into consideration assessment of competitors (in sense of level and direction of change)	Sometimes lapse a lot of time from the latest competitors’ decision (different info packages being bases for decisions)

Source: Own elaboration

Results

As presented below, there are substantial differences as regards the number of rating decisions made by defined CRAs:

Chart 2: Number of rating decisions made by CRAs regarding VGC



Source: Own elaboration

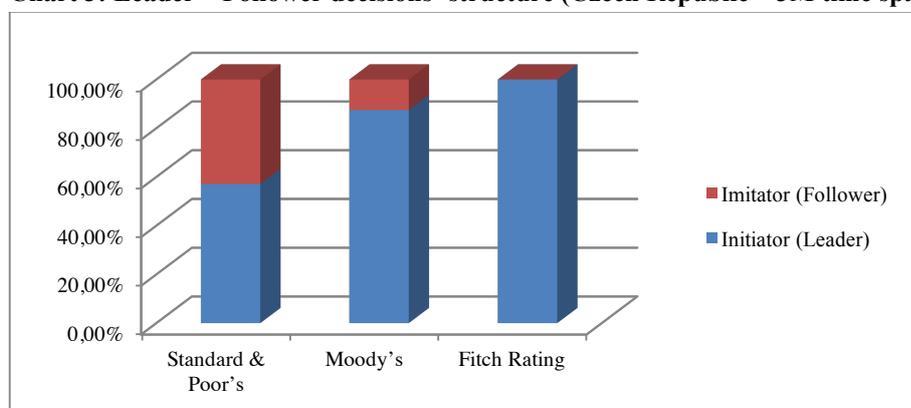
And therefore, one has to standardize the approach aimed at valuation the scale of piggy backing. That is why there were identified both actions that could be classified as initiating the chain of changes (CRA as a leader of alteration of assessment) and following the decision made by another rating agency (CRA as imitator of other CRAs' resolutions). Then it was calculated the share of steps assumed as respectively following and initiating ones:

Table 7: Czech Republic – reactions of CRAs within up to 3M time span

	Initiator (Leader)	Imitator (Follower)
Standard & Poor's	57,1%	42,9%
Moody's	87,5%	12,5%
Fitch Rating	100,0%	0,0%

Source: Own elaboration

Chart 3: Leader – Follower decisions' structure (Czech Republic – 3M time span)

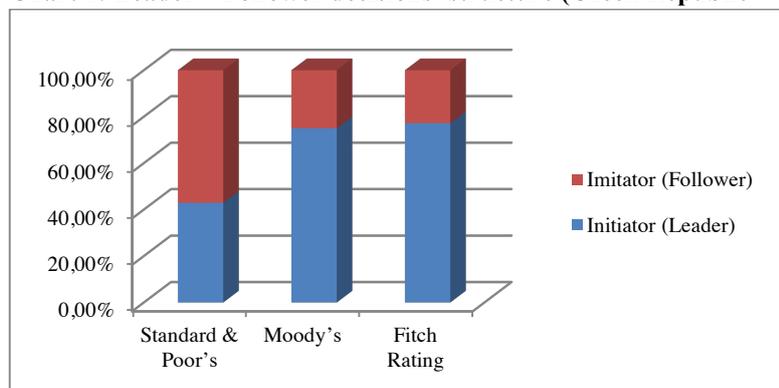


Source: Own elaboration

Table 8: Czech Republic – reactions of CRAs within up to 6M time span

	Initiator (Leader)	Imitator (Follower)
Standard & Poor's	42,9%	57,1%
Moody's	75,0%	25,0%
Fitch Rating	77,2%	22,8%

Source: Own elaboration

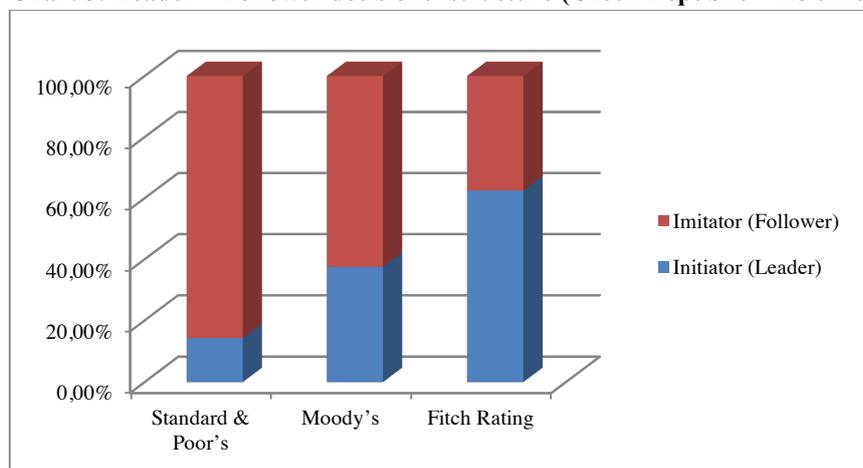
Chart 4: Leader – Follower decisions' structure (Czech Republic – 6M time span)

Source: Own elaboration

Table 9: Czech Republic – reactions of CRAs – no time span defined (lookback approach)

	Initiator (Leader)	Imitator (Follower)
Standard & Poor's	14,3%	85,7%
Moody's	37,5%	62,5%
Fitch Rating	62,5%	37,5%

Source: Own elaboration

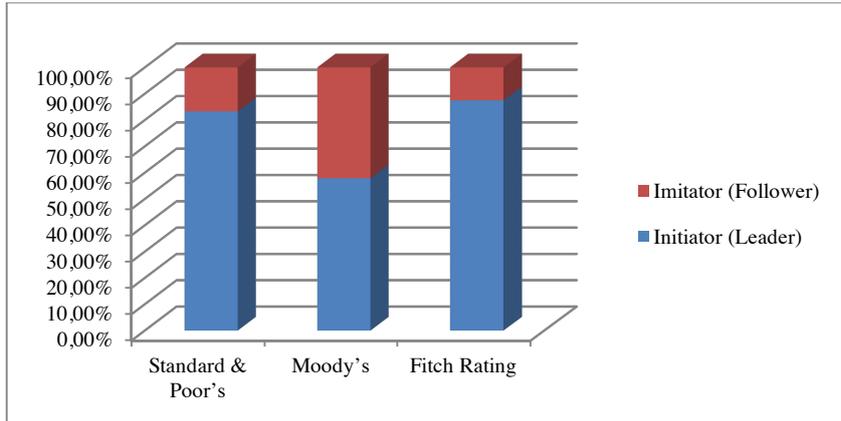
Chart 5: Leader – Follower decisions' structure (Czech Republic – No time span)

Source: Own elaboration

Table 10: Hungary – reactions of CRAs within up to 3M time span

	Initiator (Leader)	Imitator (Follower)
Standard & Poor's	83,3%	16,7%
Moody's	57,9%	42,1%
Fitch Rating	87,5%	12,5%

Source: Own elaboration

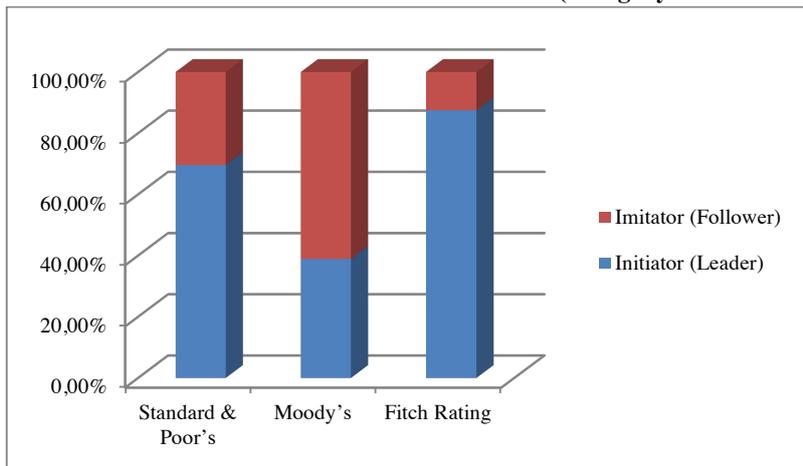
Chart 6: Leader – Follower decisions' structure (Hungary – 3M time span)

Source: Own elaboration

Table 11: Hungary – reactions of CRAs within up to 6M time span

	Initiator (Leader)	Imitator (Follower)
Standard & Poor's	69,6%	30,4%
Moody's	38,9%	61,1%
Fitch Rating	87,5%	12,5%

Source: Own elaboration

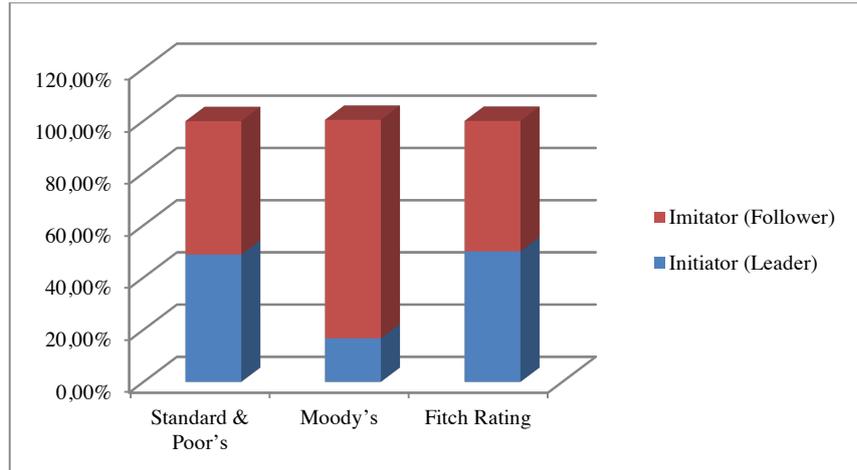
Chart 7: Leader – Follower decisions' structure (Hungary – 6M time span)

Source: Own elaboration

Table 12: Hungary – reactions of CRAs – no time span defined (lookback approach)

	Initiator (Leader)	Imitator (Follower)
Standard & Poor's	48,8%	51,1%
Moody's	16,7%	83,7%
Fitch Rating	50,0%	50,0%

Source: Own elaboration

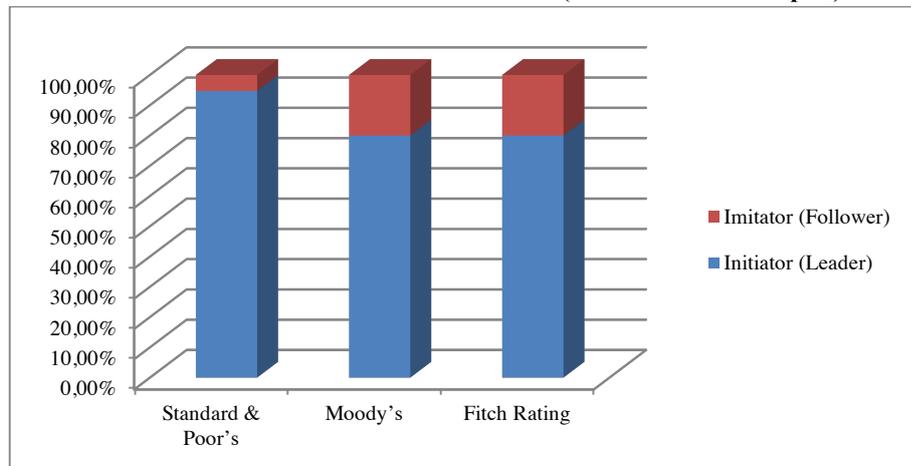
Chart 8: Leader – Follower decisions' structure (Hungary – No time span)

Source: Own elaboration

Table 13: Poland – reactions of CRAs within up to 3M time span

	Initiator (Leader)	Imitator (Follower)
Standard & Poor's	94,7%	5,3%
Moody's	80,0%	20,0%
Fitch Rating	80,0%	20,0%

Source: Own elaboration

Chart 9: Leader – Follower decisions' structure (Poland – 3M time span)

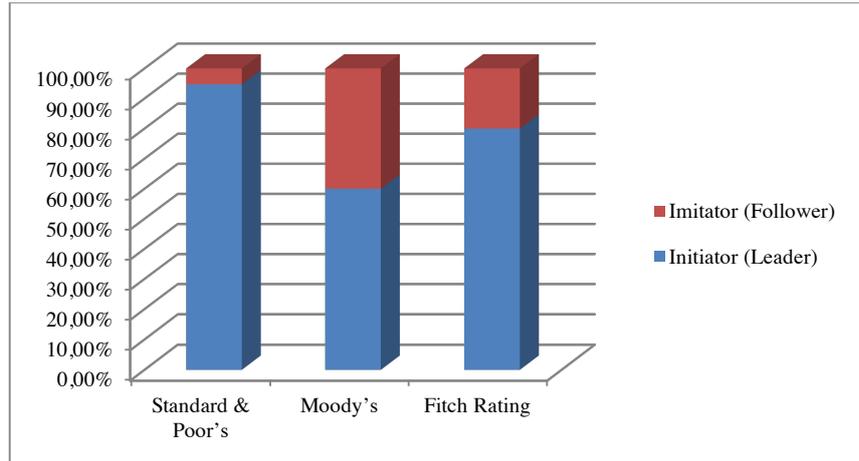
Source: Own elaboration

Table 14: Poland – reactions of CRAs within up to 6M time span

	Initiator (Leader)	Imitator (Follower)
Standard & Poor's	94,7%	5,3%
Moody's	60,0%	40,0%
Fitch Rating	80,0%	20,0%

Source: Own elaboration

Chart 10: Leader – Follower decisions’ structure (Poland – 6M time span)



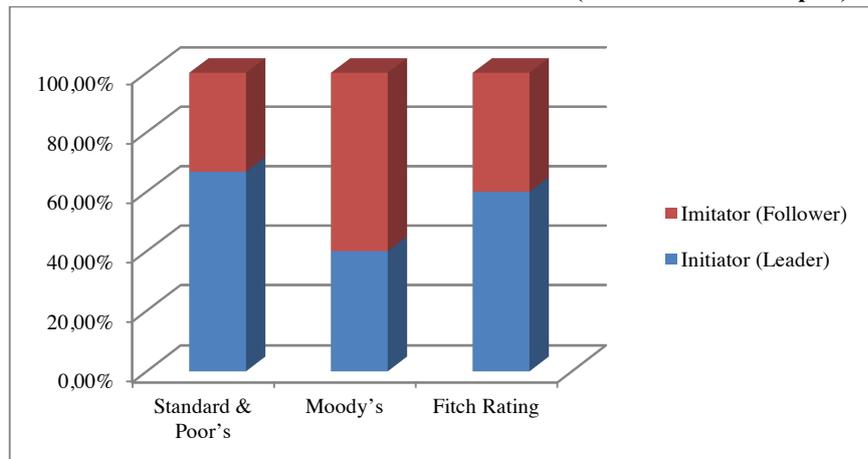
Source: Own elaboration

Table 15: Poland– reactions of CRAs – no time span defined (lookback approach)

	Initiator (Leader)	Imitator (Follower)
Standard & Poor's	66,7%	33,3%
Moody's	40,0%	60,0%
Fitch Rating	60,0%	40,0%

Source: Own elaboration

Chart 11: Leader – Follower decisions’ structure (Poland – No time span)

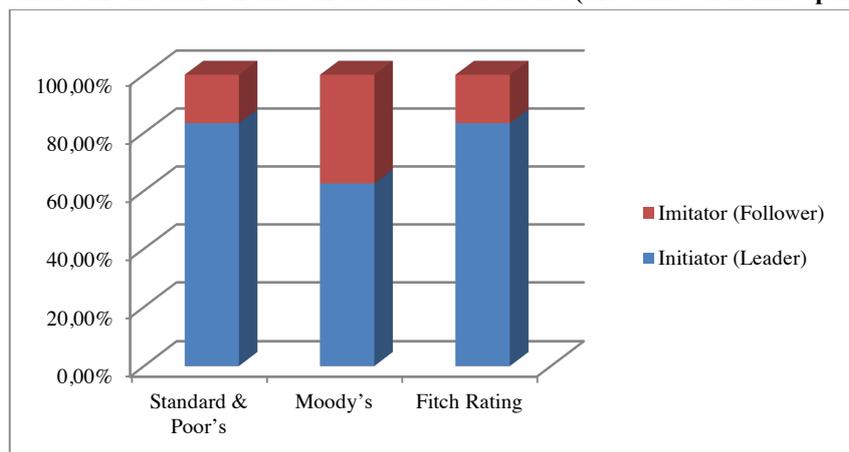


Source: Own elaboration

Table 16: Slovakia – reactions of CRAs within up to 3M time span

	Initiator (Leader)	Imitator (Follower)
Standard & Poor's	83,3%	16,7%
Moody's	62,5%	37,5%
Fitch Rating	83,3%	16,7%

Source: Own elaboration

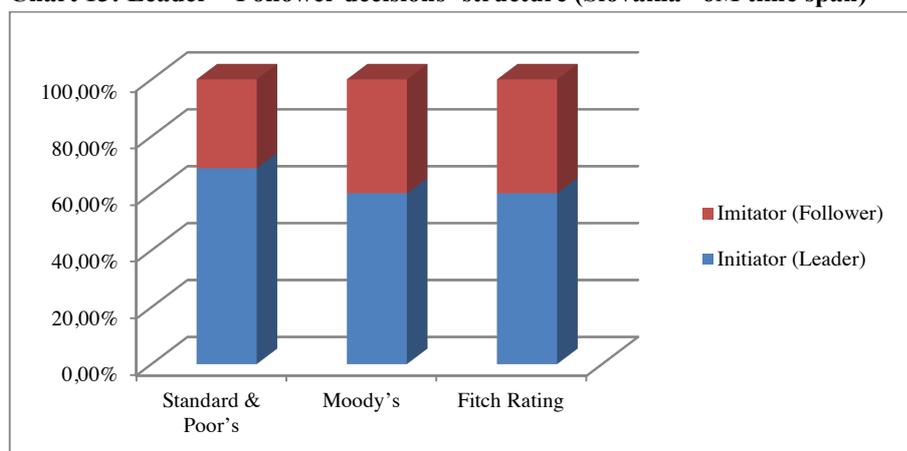
Chart 12: Leader – Follower decisions' structure (Slovakia– 3M time span)

Source: Own elaboration

Table 17: Slovakia – reactions of CRAs within up to 6M time span

	Initiator (Leader)	Imitator (Follower)
Standard & Poor's	68,8%	31,2%
Moody's	60,0%	40,0%
Fitch Rating	60,0%	40,0%

Source: Own elaboration

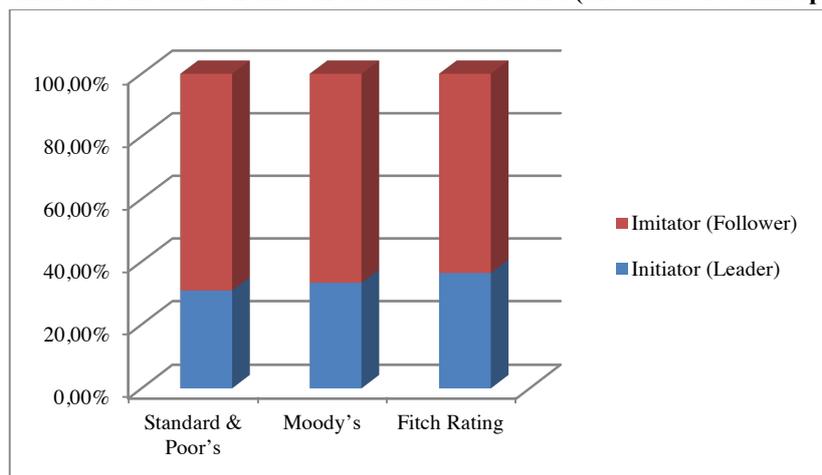
Chart 13: Leader – Follower decisions' structure (Slovakia– 6M time span)

Source: Own elaboration

Table 18: Slovakia – reactions of CRAs – no time span defined (lookback approach)

	Initiator (Leader)	Imitator (Follower)
Standard & Poor's	30,8%	69,2%
Moody's	33,3%	66,7%
Fitch Rating	36,4%	63,6%

Source: Own elaboration

Chart 14: Leader – Follower decisions' structure (Slovakia– No time span)

Source: Own elaboration

Table 19: Summary of results

	Time span up to 3M	Time span up to 6M	Lookback approach
Czech Republic			
Standard & Poor's	3	3	3
Moody's	2	2	2
Fitch Ratings	1	1	1
Hungary			
Standard & Poor's	2	2	2
Moody's	3	3	3
Fitch Ratings	1	1	1
Poland			
Standard & Poor's	1	1	1
Moody's	2	3	3
Fitch Ratings	2	2	2
Slovakia			
Standard & Poor's	1	3	3
Moody's	3	1	1
Fitch Ratings	1	1	1

Legend:

- 1 – The highest percentage of leading decisions in total of leading and following ones among all CRAs
- 2 - The medium percentage of leading decisions in total of leading and following ones among all CRAs
- 3 - The lowest percentage of leading decisions in total of leading and following ones among all CRAs

Source: Own elaboration

Conclusions

The research allowed to position the main credit rating agencies as far as the criterion of independence is concerned. Assuming the change of rating or outlook in the same direction as it was done by the competitor is treated as a decision somehow imitating the competitor, the conclusions seem to be the following:

- Despite usage of different methodologies in case of all countries, the results allow unanimously for indication of the leader (the CRA that in the highest share of decisions is the one presenting new and different from the previous ones assessments). In case of Czech Republic, Slovakia and Hungary it is Fitch Ratings whereas, for rating of Poland, S&P's opinions seem to be the most important.
- As regards the identification of the follower it is quite clear in case of Czech Republic (S&P), Hungary (Moody's) and Poland (Moody's)
- Even limiting the research only to four neighboring countries having similar history and representing suchlike level of economic development one is not able to point out one credit rating agency which analyses

and assessments are benchmarks or patterns for other agencies in case of all countries. The leadership is therefore heterogenic,

- There is no relation between number of rating decisions and the behavior of the specific credit rating agency, e.g., it is not the case that for initiator (leader) makes the highest or the lowest number of decision during the verified period (Czech Republic – 25 years, Hungary – 29 years, Poland – 23 years and Slovakia – 24 years).

It is worth also noticing that setting up defined dates of publishing the sovereign ratings (twice or three times a year) solves the problem of unexpected rating actions, however simultaneously creates suspicion that CRAs presenting their opinions after publications of their competitors' rating may be accused of piggy backing. Therefore one should think over the modification of the up-to-date standards toward introduction an obligation to publish assessments (not only ratings but outlooks as well) on the same dates, if possible also on the frequenter basis (3-4 times a year). Since the main credit rating agencies despite the various approaches tend to follow similar rating procedures, another postulate appears (IOSCO 2003, p. 5). In order to foster differentiation of approaches, the methodologies shall not be revealed to the public however, without any restriction for the supervisory body to assess it. Simultaneously it is important so that the actions of supervisory body would not result in unification of methodologies.

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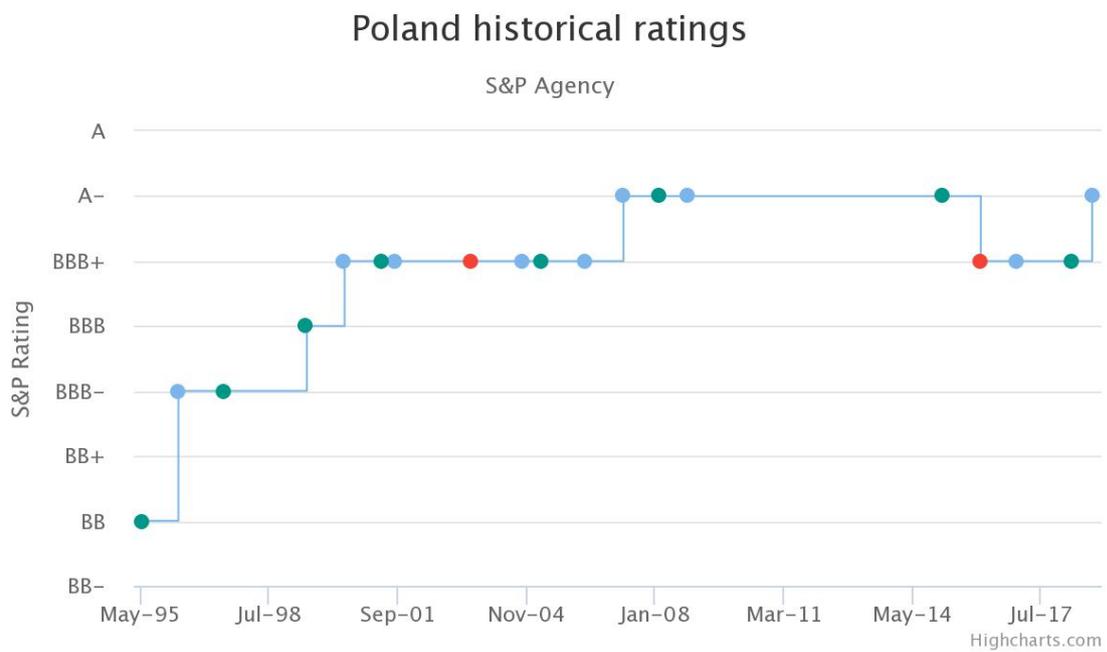
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Appendix 1

Visegrad Group countries rating evolution

Legend:

- - positive outlook assigned by the CRA
- - negative outlook assigned by the CRA
- - change of rating made by the CRA

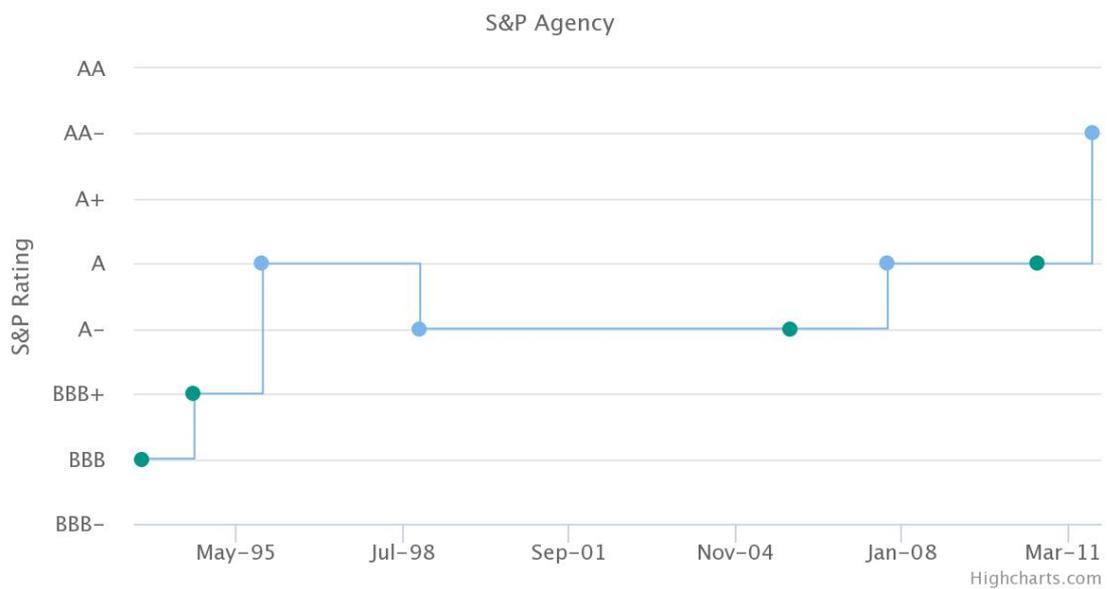


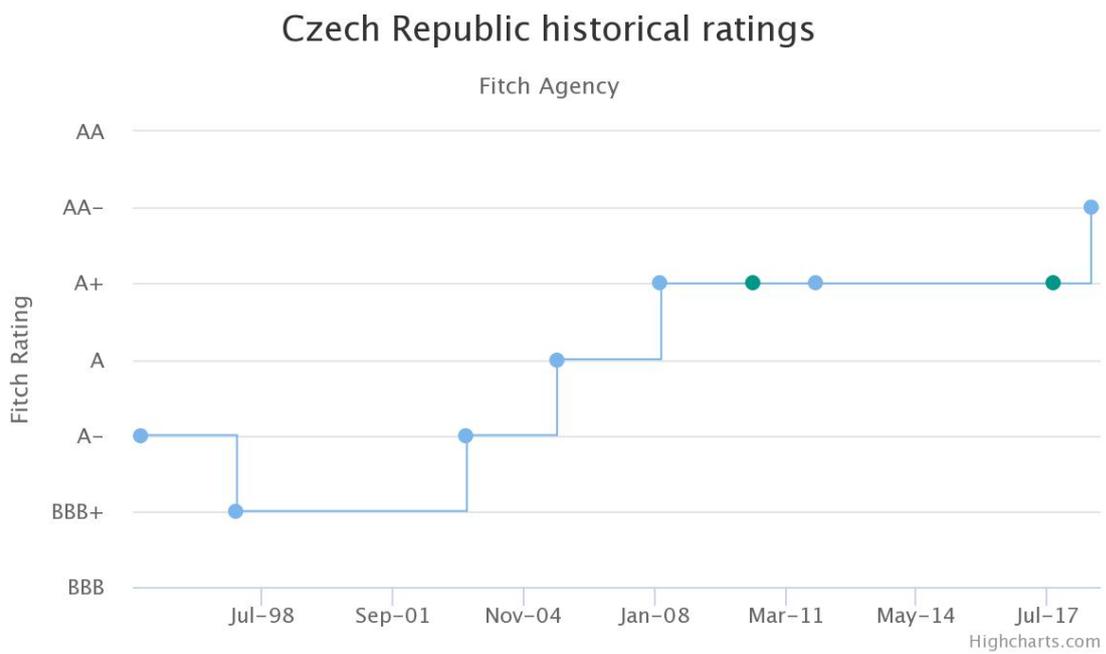
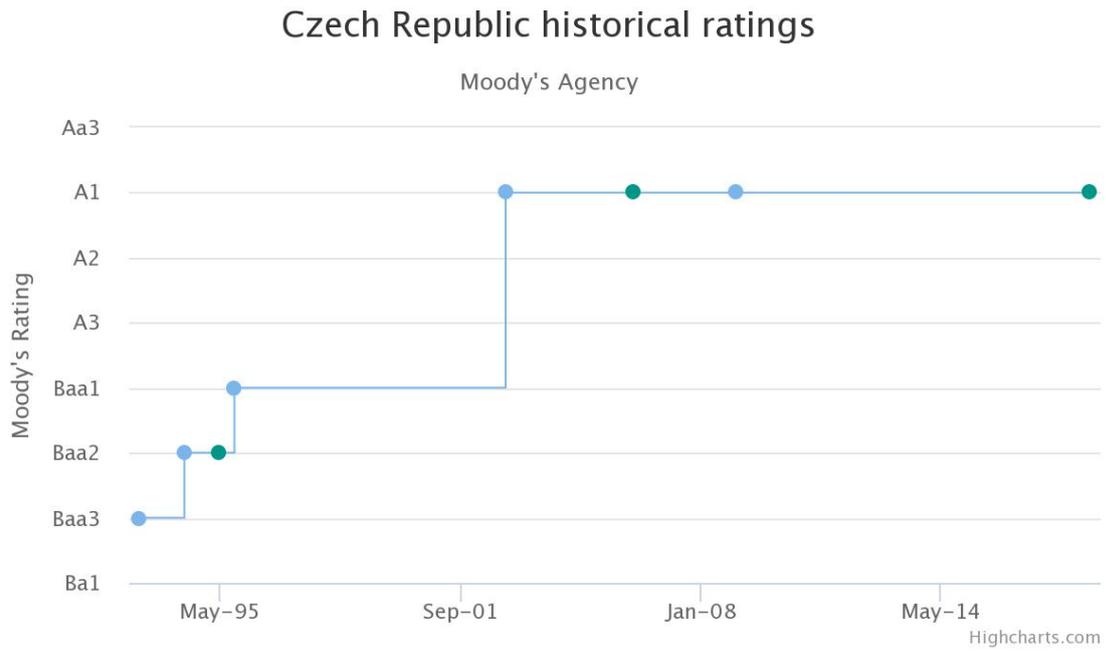
Poland historical ratings



Source: <http://www.worldgovernmentbonds.com/credit-rating/poland/>

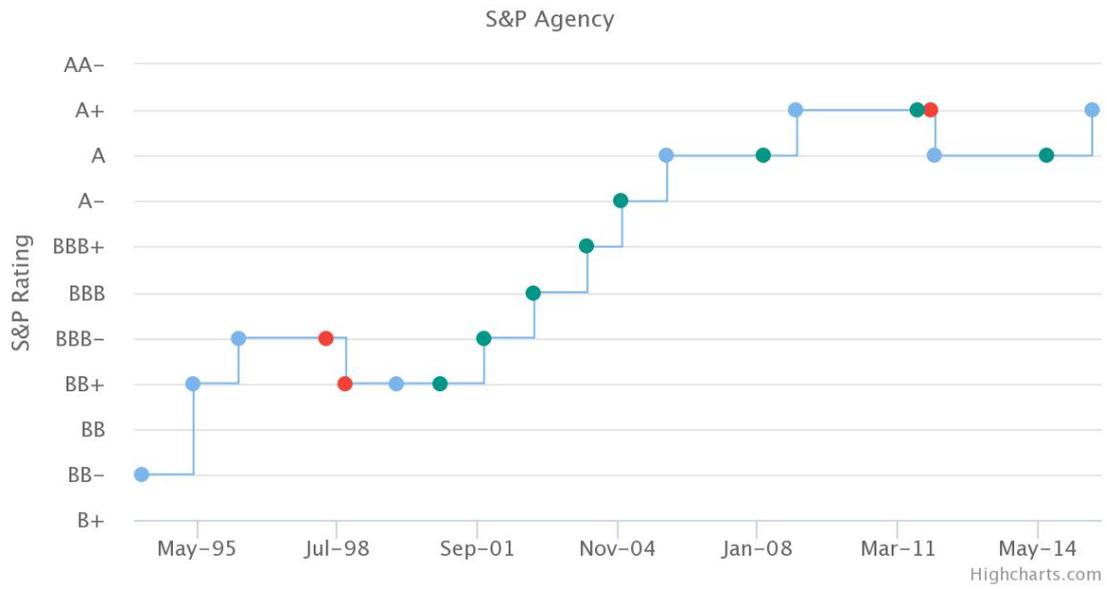
Czech Republic historical ratings



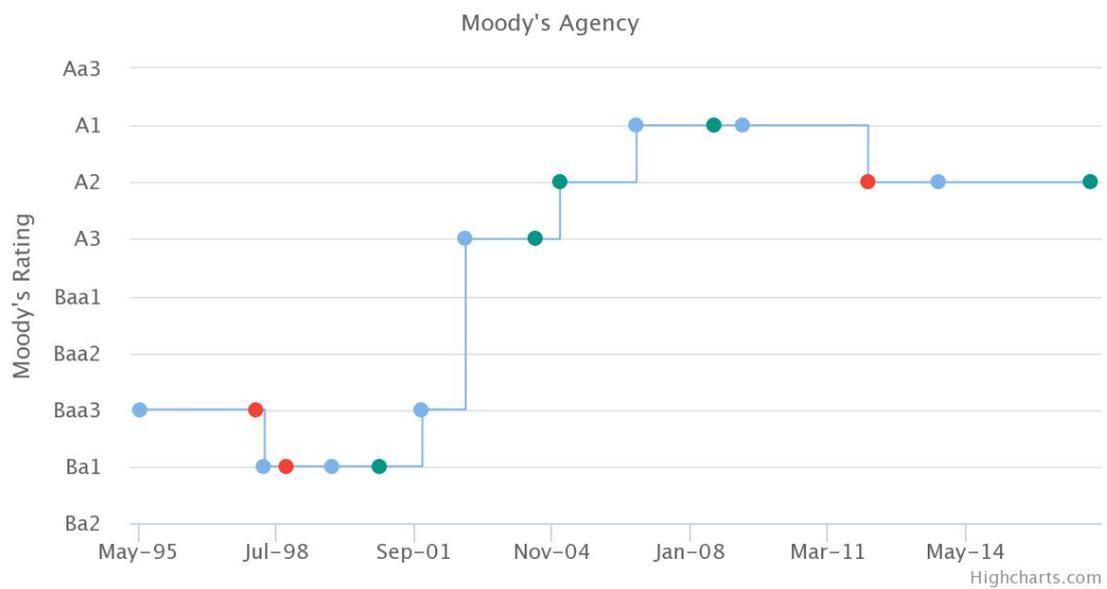


Source: <http://www.worldgovernmentbonds.com/credit-rating/czech-republic/>

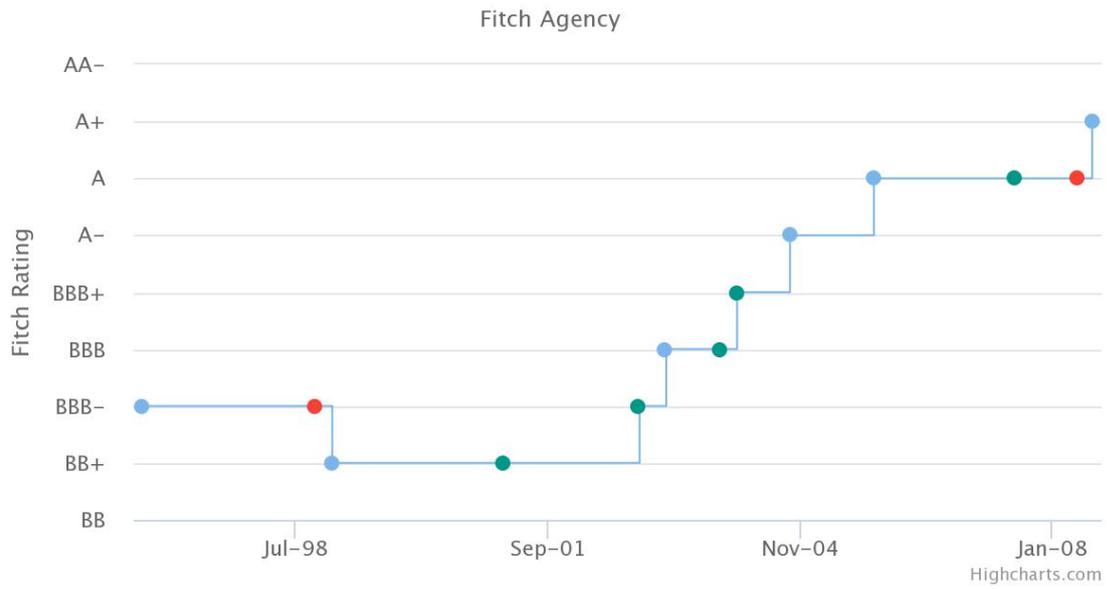
Slovakia historical ratings



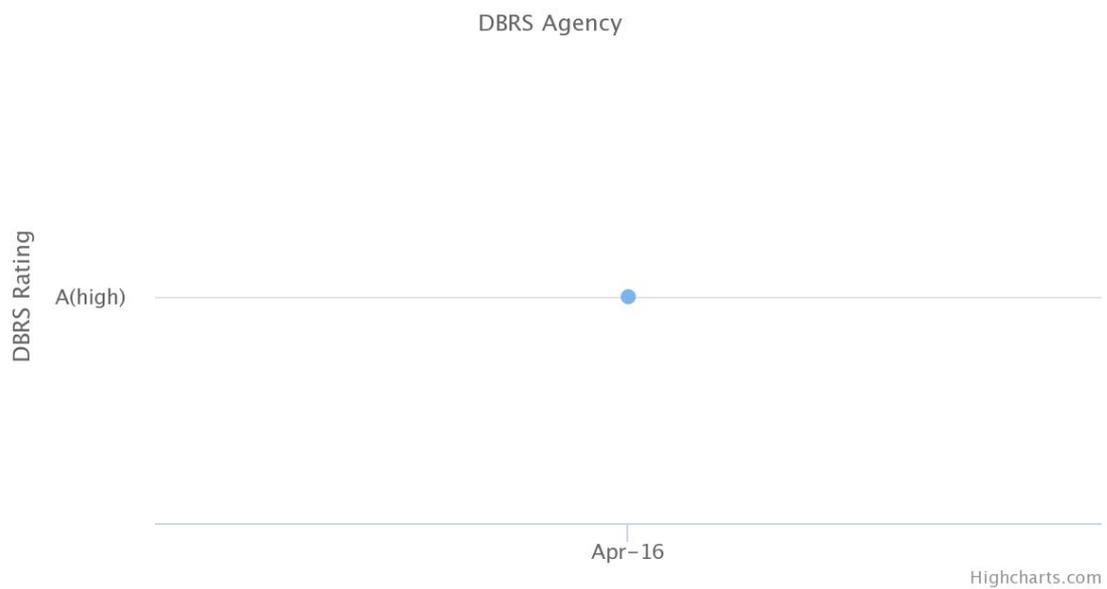
Slovakia historical ratings



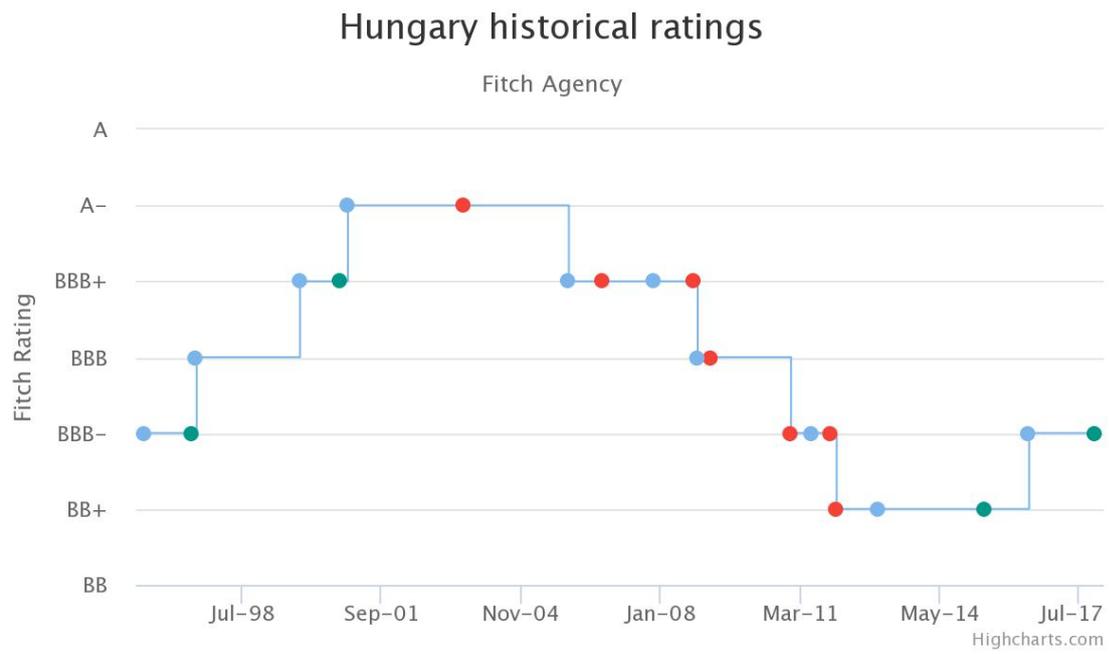
Slovakia historical ratings



Slovakia historical ratings



Source: <http://www.worldgovernmentbonds.com/credit-rating/slovakia/>



Source: <http://www.worldgovernmentbonds.com/credit-rating/hungary/>