SOVEREIGN CREDIT QUALITY IN THE EUROZONE: A PRELIMINARY CLASSIFICATION SYSTEM

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ABSTRACT

The idea of common currency with single monetary policy without strongly enforced fiscal guidelines is found to be a flawed structure in the Eurozone from the aftermath of recent years' financial crisis. The strong currency policy in the Eurozone does not help economically weak member countries to compete effectively. Growing dependence on external capital inflows to cover weaker countries' rising trade imbalances can only make the country fiscally less secure. Without any punitive trigger, an economically weak country can fall into a downward spiral and cause currency union to come apart. This paper examines and compares the economic profiles of Eurozone countries to observe how similar or dissimilar these countries are on the seven economic dimensions. This analysis helps us to assess the countries' capacity to pay their debt. Classification and clustering methodology of Mahalanobis D², canonical correlation, and canonical discriminant is applied to the economic data collected for Eurozone countries. Our analyses reveal that Greece, Italy, and Spain have been classified and separated from the other countries on the basis of seven economic factors and therefore belongs to a separate group that may lack the capacity to pay their debt. Thus, this analysis provides a diagnostics on the determinants of sovereign credit quality in the Eurozone countries from the lenders perspective.

INTRODUCTION AND BACKGROUND

Sovereign credit risk is receiving growing attention over the last three years heightened by the effects of financial crisis of 2008. To minimize the damage induced by the financial crisis western nations accepted transfer of a significant portion of private sector debt onto their respective national balance sheets. The anemic economic growth rates exacerbated their fiscal woes which, in turn resulted in steeply rising debt/GDP ratios. Alarmed by this trend, the bond rating agencies began issuing watches and warnings of credit downgrades. The world's largest debtor nation, the U.S.A was not spared. The Standard & Poor's rating agency lowered U.S. Treasury debt rating to AA⁺. This is a significant blow to the U.S. credibility and left a historic blemish in its credit record. Theoretically, finance text books can no longer treat U.S. Treasury yield as a surrogate for "Risk-Free" rate. As a practical matter, the U.S, debt downgrade did not materially affect Treasury's borrowing cost. This is because of the Federal Reserve's willingness

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to supply abundant credit. Currently, bond market is treating this development as temporary and insignificant.

	TABLE 1: Mahalanobis Squared Distance- D ² by Countries.													
From	Lith	Aus	Bel	Сур	Finld	Swed	Fran	Germ	Hung	Irel	Poln	Denm	Ital	Malta
Lith	0.00	147.00	160.31	71.71	50.16	69.55	83.00	134.42	72.14	46.67	26.09	77.38	233.03	79.01
Aus	147.00	0.00	10.23	31.90	30.62	24.84	17.78	2.57	35.25	47.34	55.18	17.62	33.59	21.22
Bel	160.31	10.23	0.00	28.90	42.95	45.31	14.37	6.89	26.36	54.04	61.91	33.22	9.35	18.82
Сур	71.71	31.90	28.90	0.00	16.39	31.49	5.64	29.19	15.91	15.41	14.69	21.46	56.87	1.66
Finld	50.16	30.62	42.95	16.39	0.00	4.06	14.56	24.41	18.56	21.76	11.42	3.49	89.12	13.94
Swed	69.55	24.84	45.31	31.49	4.06	0.00	23.31	20.20	29.64	33.99	24.53	2.39	94.65	24.99
Fran	83.00	17.78	14.37	5.64	14.56	23.31	0.00	13.19	10.28	14.47	17.84	16.35	40.76	1.47
Germ	134.42	2.57	6.89	29.19	24.41	20.20	13.19	0.00	25.44	45.25	48.82	14.26	30.52	18.04
Hung	72.14	35.25	26.36	15.91	18.56	29.64	10.28	25.44	0.00	27.27	21.15	23.72	55.27	12.11
Irel	46.67	47.34	54.04	15.41	21.76	33.99	14.47	45.25	27.27	0.00	7.04	32.46	96.02	14.92
Poln	26.09	55.18	61.91	14.69	11.42	24.53	17.84	48.82	21.15	7.04	0.00	24.96	110.47	15.77
Denm	77.38	17.62	33.22	21.46	3.49	2.39	16.35	14.26	23.72	32.46	24.96	0.00	75.07	16.61
Ital	233.03	33.59	9.35	56.87	89.12	94.65	40.76	30.52	55.27	96.02	110.47	75.07	0.00	45.89
Malta	79.01	21.22	18.82	1.66	13.94	24.99	1.47	18.04	12.11	14.92	15.77	16.61	45.89	0.00
Neth	142.91	2.06	21.06	39.45	29.65	20.12	24.44	6.29	43.59	48.48	56.18	15.96	51.66	28.13
Roma	6.98	109.91	130.79	51.31	35.32	50.24	62.45	105.21	59.41	28.40	15.36	55.51	199.39	57.40
Portu	86.17	49.32	30.45	7.08	34.97	56.27	10.12	41.66	17.37	23.44	25.84	43.81	48.60	8.50
Bulg	3.08	149.24	161.44	65.83	50.54	73.23	84.19	138.18	72.98	51.29	27.61	77.44	231.47	76.40
Gree	208.09	78.74	36.25	56.72	111.66	134.56	49.26	71.30	57.81	87.73	104.66	111.98	23.10	52.56
Spain	12.36	163.12	156.68	67.29	63.69	93.05	80.95	144.81	70.69	51.41	32.26	96.12	216.13	76.85
Esto	6.83	187.55	208.77	105.22	69.58	88.09	121.33	173.13	106.40	81.54	51.11	98.66	292.86	115.09
UK	69.59	17.98	24.98	8.72	11.60	17.67	3.98	17.10	14.61	8.10	12.59	13.26	59.85	4.91
Latv	3.72	189.54	199.79	100.34	75.22	98.49	113.90	173.09	93.90	72.55	46.70	107.43	277.11	109.76
Slovk	3.72	122.20	132.30	51.93	36.70	55.48	61.78	110.15	57.92	32.20	14.76	61.99	198.36	57.89
Luxe	62.28	52.17	89.99	57.22	16.74	9.23	52.79	51.57	60.69	46.77	35.26	16.77	155.85	52.55
Slovn	30.43	49.71	68.80	19.73	7.42	15.30	24.21	47.44	31.42	12.11	5.22	16.33	123.19	21.09
Czech	32.30	46.86	65.13	18.24	6.25	13.86	22.25	44.34	28.83	12.17	4.83	14.82	118.47	19.17

However, some new dangers may yet lie ahead for public finances of several western nations as the new round of capital standards are enforced by Basel committee and the Volker rule under Dodd-Frank Bill is implemented in the U.S. While the western nations, in general, experienced weakening of their public finances, some nations like Canada, Germany, UK, and Brazil seem to be holding up quite well.

Fiscal Fissures in the Eurozone

The move to adopt a common currency with single monetary policy but without a commonly enforced fiscal discipline is flawed from the outset. Adopting a strong currency (\in) , which is essentially a derivative of Deutsche mark does not help an economically weak member country to compete effectively in export markets. This relatively weak external trade position forces a nation to import more capital (mostly through the sale of debt instruments) to sustain itself. Continuation of status quo does not help the weak country to improve its competitive position. Continuously growing dependence on external capital inflows to cover its rising trade imbalances can only make the country fiscally unsound. Without an automatic punitive trigger, an economically weak country such as, Spain, Greece or Italy can get into a downward spiral without a proper recourse and can cause the bonds of currency union to rupture. Strong currency for an externally noncompetitive economy is no cure for its ills. The Eurozone has to rethink and redesign its economic union so as to foster an enduring harmony in their economic profiles.

Sovereign Credit Quality

A credit rating is simply a reflection of the borrower's **ability** and **willingness** to return the principal along with the interest to the lender. When the borrower and the lender are both legally domiciled in a single nation, it is convenient for the lender to assess and monitor the borrower's ability to pay. The legal system can act as an imposing deterrent to the laxity in payment. However, when the borrower and lender are separated by national boundaries, the lender does not have as much enforcing power to motivate a less willing borrower to pay. In addition, if the borrower is a sovereign nation, a foreign lender (bond buyer) has little or no power to make an unwilling borrower to pay. Therefore, judging the borrowers willingness to pay is critical in assessing the credit risk of a sovereign borrower. A sovereign nation can get away with nonpayment in the name of "national interest". History is replete with the examples from Greece, Central Europe, Russia, and Latin America. In international lending, legal recourse to the borrower is very limited at best. In light of these limitations, the buyers of sovereign debt are entirely dependent upon the country's capacity to pay and willingness to pay becomes a paramount importance. A sovereign nation's credit rating is affected by its capacity to pay and its willingness to honor its obligation to pay. Let us take up each of these two aspects in detail. First, country's capacity to pay is dependent upon its ability to compete globally and its endowed

resources relative to its debt load. Economic profile of the country can shed some light on this front. Second, country's willingness to pay rests with the nature of its political system, history, social, and cultural dimensions. Totalitarian regime like dictatorships, communist/socialist rulers are more apt to default. In recent years, even democratic regimes have demonstrated dilutive character of their willingness to pay. Diminished commitment to pay was evident in the borrower's demands of concessions on principal write downs (haircuts) and deferred payments (stretched maturities). These things happened with Latin American debt (Brady bonds) under the supervision of IMF and the U.S.A. In the current European debt crisis, similar demands are placed on the Greek lenders. Common currency umbrella over the Eurozone is opening many pathways to risk of moral hazards among the Eurozone members.

	TABLE 1 (contd.): Mahalanobis Squared Distance- D ² by Countries.												
From	Neth	Roma	Portu	Bulg	Gree	Spain	Esto	UK	Latv	Slovk	Luxe	Slovn	Czech
Lith	142.91	6.98	86.17	3.08	208.09	12.36	6.83	69.59	3.72	3.72	62.28	30.43	32.30
Aus	2.06	109.91	49.32	149.24	78.74	163.12	187.55	17.98	189.54	122.20	52.17	49.71	46.86
Bel	21.06	130.79	30.45	161.44	36.25	156.68	208.77	24.98	199.79	132.30	89.99	68.80	65.13
Сур	39.45	51.31	7.08	65.83	56.72	67.29	105.22	8.72	100.34	51.93	57.22	19.73	18.24
Finld	29.65	35.32	34.97	50.54	111.66	63.69	69.58	11.60	75.22	36.70	16.74	7.42	6.25
Swed	20.12	50.24	56.27	73.23	134.56	93.05	88.09	17.67	98.49	55.48	9.23	15.30	13.86
Fran	24.44	62.45	10.12	84.19	49.26	80.95	121.33	3.98	113.90	61.78	52.79	24.21	22.25
Germ	6.29	105.21	41.66	138.18	71.30	144.81	173.13	17.10	173.09	110.15	51.57	47.44	44.34
Hung	43.59	59.41	17.37	72.98	57.81	70.69	106.40	14.61	93.90	57.92	60.69	31.42	28.83
Irel	48.48	28.40	23.44	51.29	87.73	51.41	81.54	8.10	72.55	32.20	46.77	12.11	12.17
Poln	56.18	15.36	25.84	27.61	104.66	32.26	51.11	12.59	46.70	14.76	35.26	5.22	4.83
Denm	15.96	55.51	43.81	77.44	111.98	96.12	98.66	13.26	107.43	61.99	16.77	16.33	14.82
Ital	51.66	199.39	48.60	231.47	23.10	216.13	292.86	59.85	277.11	198.36	155.85	123.19	118.47
Malta	28.13	57.40	8.50	76.40	52.56	76.85	115.09	4.91	109.76	57.89	52.55	21.09	19.17
Neth	0.00	104.07	63.10	146.78	104.04	167.43	179.63	20.10	185.98	119.93	39.64	45.81	43.38
Roma	104.07	0.00	72.58	8.30	186.28	27.88	19.19	45.02	18.75	7.98	40.46	13.81	15.52
Portu	63.10	72.58	0.00	82.16	31.02	65.90	127.58	20.52	112.07	64.15	94.78	41.58	39.73
Bulg	146.78	8.30	82.16	0.00	205.54	13.00	7.49	72.13	6.98	5.98	66.67	30.51	32.18
Gree	104.04	186.28	31.02	205.54	0.00	170.73	274.49	71.38	241.91	177.12	201.68	132.89	129.28
Spain	167.43	27.88	65.90	13.00	170.73	0.00	25.44	79.57	14.28	9.38	102.01	48.23	49.35
Esto	179.63	19.19	127.58	7.49	274.49	25.44	0.00	105.34	5.89	14.99	71.47	48.95	51.35

	TABLE 1 (contd.): Mahalanobis Squared Distance- D ² by Countries.												
From	Neth	Roma	Portu	Bulg	Gree	Spain	Esto	UK	Latv	Slovk	Luxe	Slovn	Czech
UK	20.10	45.02	20.52	72.13	71.38	79.57	105.34	0.00	100.09	53.13	36.38	13.87	12.79
Latv	185.98	18.75	112.07	6.98	241.91	14.28	5.89	100.09	0.00	12.90	89.60	53.48	55.84
Slovk	119.93	7.98	64.15	5.98	177.12	9.38	14.99	53.13	12.90	0.00	54.34	20.78	21.73
Luxe	39.64	40.46	94.78	66.67	201.68	102.01	71.47	36.38	89.60	54.34	0.00	16.88	16.74
Slovn	45.81	13.81	41.58	30.51	132.89	48.23	48.95	13.87	53.48	20.78	16.88	0.00	0.15
Czech	43.38	15.52	39.73	32.18	129.28	49.35	51.35	12.79	55.84	21.73	16.74	0.15	0.00

REARCH METHODS

The purpose of this research is to conduct an empirical investigation of the factors governing the determination of a sovereign nation's debt rating. This research uses Canonical Discriminant Analysis to classify countries that are similar in their economic profile and thus acts as a determination factor of sovereign nation's debt rating. The study focuses on the 27 countries of the European Union (EU). The following variables are used in the analysis to capture the "capacity" and "willingness" to pay.

- 1. Public debt as % of GDP
- 2. Budget balance as % of GDP
- 3. Current account balance as % of GDP
- 4. Foreign Exchange reserves as % of current account balance
- 5. GDP growth rate
- 6. Inflation rate
- 7. Unemployment rate

Canonical Discriminant Analysis will primarily be used to group similar countries together based on these above mentioned economic/financial characteristics. We will also apply multivariate measures such as, Mahalanobis D^2 or Hotelling's T^2 to observe the economic/financial separation between the EU countries based on the economic/ financial factors.

To facilitate the analysis the following discussion is for two populations for simplicity purposes. Let us consider $\mathbf{x}_{i1}, \mathbf{x}_{i2}, \dots, \mathbf{x}_{iNi}$ are random samples from two multivariate normal populations, \mathbf{N}_p (μ_i, Σ_i) for i=1,2. Then, the multivariate test-statistic Hotelling's T² to test the difference between two mean vectors is defined as,

$$T^{2} = \frac{N_{1}N_{2}}{N_{1} + N_{2}} (\hat{\mu}_{1} - \hat{\mu}_{2})' \hat{\Sigma}^{-1} (\hat{\mu}_{1} - \hat{\mu}_{2}) \qquad \qquad \hat{\Sigma} = \frac{(N_{1} - 1)\hat{\Sigma}_{1} + (N_{2} - 1)\hat{\Sigma}_{2}}{N_{1} + N_{2} - 2}$$
and

In the above equation, μ_1 and μ_2 are the two mean vectors from two different populations and Σ is the pooled variance-covariance matrix (see, Johnson 1998, p.420 for further details). Note that Hotelling's T² is proportional to the Mahalanobis D² to measure the distance between two mean vectors μ_1 and μ_2 . Therefore, Mahalanobis D² measure alone is sufficient to perform the multivariate analysis and test the difference between two mean vectors at a multidimensional level. Consequently, only Mahalanobis D² measure will be used in this paper for the assessment of separation or closeness of these countries economic/financial profiles.

Therefore, at the initial stage of our analysis Mahalanobis D^2 methodology will be used to observe the similarities and differences between these countries economic/financial profiles on the basis of multidimensional economic/financial factors collectively. Canonical discriminant analysis, a dimension reduction technique will then be used to classify countries that are grouped together and the group of countries that are separated from the other groups of countries. Thus, the countries those do not have the similar characteristics of core European Union countries on the basis of their economic/financial characteristics will be separated. Therefore, this technique classifies countries according to their economic/financial similarities and clusters them together into a group and at the same time keep them separated from other groups of countries that have dissimilar economies. The resulting clusters of countries should then exhibit high internal homogeneity and high external heterogeneity. Accordingly, if the classification is successful, countries within the cluster will be closer together in-terms of their economic situation and hence their bond ratings and countries between clusters will be economically distanced.

TABLE 2: Univariate and Multivariate Tests on Equality of Means									
Univariate Test Statistics									
Variable	Total Poolec Standard Standar Deviation Deviatio		Between Standard Deviation	R-Square	R- Square / (1- RSq)	F Value	Pr > F		
GDP Growth Rate	4.5478	4.8237	1.4100	0.0933	0.1028	0.43	0.992		
Current Account Balance % of GDP	7.0369	4.7959	5.6510	0.6256	1.6712	6.94	<.000		
Inflation	2.5737	2.3205	1.5344	0.3448	48 0.5263 2.19		0.002		
Public Debt % of GDP	31.3060	11.7565	29.9232	0.8863	7.7980	32.39	<.000		
Unemployment Rate	3.7180	2.7458	2.8258	0.5604	1.2749	5.30	<.000		
Budget Balance % of GDP	4.7884	3.7363	3.4695	0.5093	1.0379	4.31	<.000		
Foreign Exchange % of CAB	2589	2691	942.8143	0.1287	0.1477	0.61	0.923		
Mult	ivariate Test S	Statistics and	l F Approxin	nations					
Statistic	Val	ue	F Value	Num DF	Den D	F I	Pr > F		
Wilks' Lambda	0.0007	9457	7.21	182	703.53	3 🔹	<.0001		
Pillai's Trace	3.1738	5317	3.45	182	756		<.0001		
Hotelling-Lawley Trace	35.877	57008	19.79	182	512.10	6 <	<.0001		
Roy's Greatest Root	26.258	99803	109.08	26	108		<.0001		

EMPIRICAL CLASSIFICATION FOR CREDIT QUALITY

This research examines the phenomenon of country classification in two different steps with the objective to identify countries debt rating status in terms of their economic profile. First, we have calculated the mean vectors of size seven for seven economic factors for each of the 27 different countries and their correlation matrix (results not reported) to identify possible similarities or differences between countries in-terms economic characteristics by using univariate analysis, along with other descriptive statistics (results not reported). These preliminary analyses encouraged us to perform multivariate analyses using Mahalanobis D² and Canonical Correlation. Analyses were done using SAS programming software and the results were reported in Table 1 and Table 3. Results show that Mahalanobis D^2 is consistently higher with Greece, Spain, and Italy. In addition, Estonia and Latvia also exerted some higher values on these Mahalanobis D^2 statistics. Therefore, the natural flow of analysis is to employ Canonical Discriminant Analysis using SAS to separate and cluster countries that are together according to their economic profile. Univariate mean comparison tests that are reported in Table 2 (top half) by economic factors reveal that five out of seven economic factors considered in this study are significantly differentiating country specific means with the most significant ones being Public Debt as % of GDP, Current Account Balance as % of GDP, and Unemployment rate with F statistics of 32.39 (p-value < 0.0001), 6.94 (p-value < 0.0001), and 5.30 (p-value < 0.0001) respectively. Country differences are found to be most widely separated according to their economic profiles by the first canonical function (Can1). Which is a linear combination of economic factors as follows: 0.0046122366 GDP growth rate + 0.1179516696 Current Account Balance - 0.2106353036 Inflation + 0.1379789893 Pub Debt -0.6145541125 Unemployment Rate + 0.1323753414 Budget Balance + 0.0000301329 Foreign Exchange Reserve with a high R^2 of 0.981486 between this canonical variable and the country classification variable. First three canonical functions are highly statistically significant. However, the first two functions alone account for 93.55% of the total variability and the eigenvalues of these two functions are greater than one. Thus, we observe that these twenty seven countries means appear to fall into a twodimensional subspace within the seven-dimensional space of economic factors. The estimated canonical variables are reported below:

CAN1 = 0.0046122366 GDP growth rate + 0.1179516696 Current Account Balance - 0.2106353036 Inflation + 0.1379789893 Pub Debt - 0.6145541125 Unemployment Rate + 0.1323753414 Budget Balance + 0.0000301329 Foreign Exchange Reserve

CAN2 = 0.0630444771GDP growth rate + 0.2802020199 Current Account Balance + 0.0150830575 Inflation - 0.0352378827 Pub Debt - 0.3520711461Unemployment Rate - 0.0581852053 Budget Balance + 0.0000100363 Foreign Exchange Reserve.

These canonical functions were then numerically calculated from the data (also known as z-scores, see Hair et. al., 1998, p.263) for each country and plotted in Graph-1 using SAS software to observe the clustered outcome of countries for the purpose of identifying countries that may lack capacity to pay their debt. This classification process identifies two different distinct cluster formations by the first canonical function. One formed by Greece and Italy and the other cluster formed by Spain, Latvia, and Estonia. Among these, Greece has been clearly separated by both canonical functions. This result is also supported by higher Mahalanobis D^2 as reported in Table 1. It is interesting to note that the first canonical variable which discriminates between above mentioned country groupings accounts for 73.19% of the total variation. Also note that the distance (or length) between clusters formed by the first canonical function (Can1) is much greater than the distance between clusters formed by the second canonical function (Can2) as can be seen with respect to axis (x and y) in Graph 1. However, second canonical function also formed another separation between Greece and others. This probably indicates that Greece's ability to pay and may also be willingness to pay their debt in jeopardy.

	TABLE 3: Canonical Discriminant Analysis												
	Canonical	Adjusted		sted Approximate		Squared			Eigenvalues of Inv(E)*H				
	Correlation	Canoni	ical Standard		Canonical								
	Correlation	Correla	tion	Error	Correlation		Eigenval	lue	Difference	Proportion	Cumulative		
1	0.981486	0.9771	64	0.003169	0.9	63315	26.259	0	18.9560	0.7319	0.7319		
2	0.937850	0.9243	99	0.010404	0.8	79562	7.3030)	6.0823	0.2036	0.9355		
3	0.741414	0.6761	23	0.038901	0.54	49694	1.2207		0.6569	0.0340	0.9695		
4	0.600459	59 0.493193		0.055240	0.30	60551	0.5638		0.2030	0.0157	0.9852		
5	0.514954	0.514954 0.411145		0.063479	0.265178		0.3609)	0.2477	0.0101	0.9953		
6	0.318896	0.318896 0.095434		0.077602	0.101695		0.1132		0.0563	0.0032	0.9984		
7	0.232077014453		0.081734	0.053860		0.0569)		0.0016	1.0000			
	Tes	t of H0: '	The o	canonical corre	elation	ns in the	e current	rov	v and all tha	t follow ar	e zero		
	Likelihood	l Ratio	Ар	proximate F V	alue	Nui	n DF		Den D	F	Pr > F		
1	0.00079	457		7.21		182			703.53		<.0001		
2	0.02165	910		3.76		150			611.15		<.0001		
3	0.17983566			1.80			120		516.02		<.0001		
4	4 0.39936326		1.19			92			418.1		0.1356		
5	5 0.62454235			0.82		66		317.4			0.8326		
6	0.84992	284		0.43		4	42	214			0.9991		
7	0.94614	022		0.31		20		108			0.9981		

Raw Canonical Coefficients								
Variable	Can1	Can2						
GDP Rate	0.0046122366	0.0630444771						
CAB % GDP	0.1179516696	0.2802020199						
Inflation	2106353036	0.0150830575						
Pub Debt % GDP	0.1379789893	0352378827						
Unemployment Rate	6145541125	3520711461						
Budget Balance % GDP	0.1323753414	0581852053						
Foreign Exchange % CAB	0.0000301329	0.0000100363						

DISCUSSION AND CONCLUSION

Adopting a common currency with single monetary policy without a commonly enforced fiscal discipline is found to be a flawed structure in recent years' financial crisis in the Eurozone. This strong currency policy in the Eurozone does not help economically weak member countries to compete effectively in the outside world. Growing dependence on external capital inflows to cover weaker countries rising trade imbalances can only make the country fiscally more unsound. Without an automatic punitive trigger, an economically weak country such as, Greece, Spain or Italy can get into a downward spiral without a proper recourse and can cause the bonds of currency union to burst. Therefore, this paper examined and compared the economic profiles of twenty seven Eurozone countries to observe how similar or dissimilar these countries are on the seven economic dimensions to identify countries' capacity to pay their debt.

This paper applied the classification and clustering methodology to economic data collected for 27 European countries. Multivariate analyses that included Mahalanobis D^2 , canonical correlation, and canonical discriminant analysis revealed that Greece, Italy, and Spain have classified and separated from the other countries on the basis of seven economic factors that we have considered in this paper. In addition, Latvia and Estonia also classified as countries at the economically similar status of Spain and belongs to those that may lack the capacity to pay their debt. Thus, this analysis provides a diagnostics on the determinants of sovereign credit risk of the Eurozone countries from the perspective of lenders. Therefore, this study suggests that the Eurozone may like to rethink and redesign its economic union so as to foster an enduring harmony in their fiscal profiles. Specifically, if the policy makers concentrate on these economic factors and implement necessary policies that increase both capacity and willingness to pay debt then and only then the Eurozone may eventually achieve currency union and thus reduce sovereign credit risk.

There is currently a proposal to sell common Eurozone bonds (similar to US Treasury bonds). This idea is premature at this time as our analysis indicates that the credit quality is not uniform across all nations in the Eurozone. The fiscal disparity is too large between the weak and strong nations. It appears that a fiscal union is a necessary first step in that direction. The fiscal union will force the outlier nations, such as, Greece, Spain, and Italy to improve their fiscal strength. When the fiscal profiles of the weaker nations improve the Eurozone may be ready to float a common Eurozone bond issue.



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