Distance to Default as a Measure of Default Risk

Universitat Autònoma de Barcelona · Faculty of Economics and Business · Bachelor of Economics

1. Abstract & Objective

Moody's KMV model has been historically the most widely used method to estimate how distant any given company is from its default (point).

I analyzed the determination of **distances-to-default (DTD)** when we only have access to information from equity capital markets and verified if there are better methods than KMV's to estimate DTD by comparing the estimations performed in this project with **Credit Default Swaps** (CDSs).

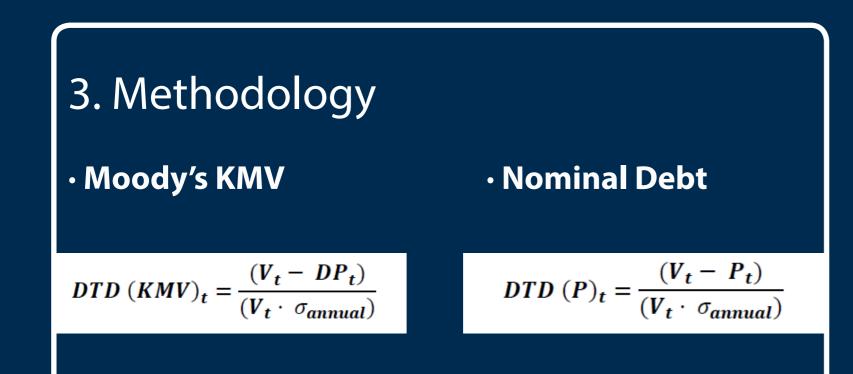
The main goal is to compare the Nominal Debt Approach against the Moody's KMV in order to verify which of the two methods better explains the market's reality.

2. Hypothesis

"The **Nominal Debt** Approach should give us **more accurate** estimates than the **Moody's KMV** Approach to measure the distance to default of a given company".

4. Data Selection & Relevant Statistics

The chosen subject of study is the combination of **42 representative companies** included in the **EURO STOXX 50 Index** (banks excluded due to high leverage ratios).



(V) stands for Market Value and (σ) represents the annualized returns of company's assets.

The only difference between the two methods is the way in which the Default Point is compounded.

In the KMV's method, the default point (DP) is obtained by adding **one-half of the long-term liabilities** plus short-term liabilities.

While on the other hand, the default point (P) is exactly **the sum of the total liabilities** of the company.

In order to compare which of the two provides better estimations I had to do two types of regressions (Cross-sectional and Time-series).

Since **CDS**s are considered a good predictor of the possible event of default, they were used as dependent

Table 4.3. DTD mean comparison (P vs. KMV) and leverage mean by supersector							
SECTOR	MEAN DTD P	MEAN DTD KMV	MEAN LEVERAGE				
Chemicals	3,280	3,614	0,402				
Industrial Goods & Services	2,778	3,042	0,599				
Insurance	2,178	2,994	0,935				
Technology	2,808	2,828	0,271				
Automobiles & Parts	1,082	2,178	0,762				
Retail	2,843	3,109	0,376				
Telecommunications	2,199	3,675	0,598				
Oil & Gas	2,740	3,200	0,503				
Utilities	1,717	2,827	0,702				
Personal & Household Goods	3,609	3,820	0,333				
Construction & Materials	1,780	2,691	0,655				
Healthcare	3,975	4,001	0,238				
Real Estate	2,344	3,463	0,505				
Media	2,769	3,378	0,553				
Food & Beverages	2,922	3,642	0,447				

5. Results

For the timeline chosen (01/01/2008 - 31/12/2013), at any level of the regressions the results show that the **R-squared values from the Nominal Debt regressions are higher than the ones performed under the KMV's approach** for both types of regressions.

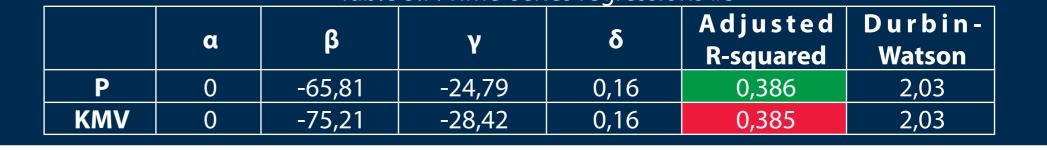
Table 5.1. R-squared results (Cross-sectional regressions)							
2008	2008	2009	2010	2011	2012	2013	
Ρ	0,523	0,510	0,268	0,324	0,419	0,440	
KMV	0,265	0,257	0,016	0,00	0,026	0,062	

Table 5.7. Time-series regressions #3

variables for both kinds of regressions.

By comparing the coefficients of determination obtained, we would get enough evidence to choose which of the two methods is more convenient.

Table 4.5. KMV vs. P correlations against CDSs					
	CORRELATION		CORRELATION		
DTDKMV08	-0,515	DTDP08	-0,724		
DTDKMV09	-0,507	DTDP09	-0,714		
DTDKMV10	-0,130	DTDP10	-0,518		
DTDKMV11	0,096	DTDP11	-0,570		
DTDKMV12	0,162	DTDP12	-0,647		
DTDKMV13	0,250	DTDP13	-0,664		



6. Conclusions

• The alternative approach gave consistently better results than the most widespread method used in the risk management industry for estimating DTD.

•The Automotive industry showed a high tendency of being close to its DTD while the Healthcare sector showed to be the one farthest from its default point.



Fernando Luna Goris fernandolugo7@gmail.com

• According to the results, CDSs and DTD seem to be negatively correlated as logically we would expect.