Regional energy markets: evidence from corporate reporting

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ECOCEP - Energy and Climate Economic Modeling, 2016

Energetics, Forbes, Companies

Energetic sector is represented in Forbes Global 2000 list as a group of more then 100 companies. Among them are

- Electric Utilities
- Natural Gas Supply
- Renewable Energy
- Nuclear Energy

It is about 1842 billion USD equivalent of sales and 4759 of assets (2014).

Regions represented

Energetic companies represent large business in all significant regions of the world:

- USA
- EU
- Canada & Australian
- Japan
- Asia (S.Korea, Malaysia, Indonesia, Philippines)
- China & India
- Latin America (Brazil, Chilly, Colombia)
- Russia

Corporate reporting database

Financial statements of corporate reporting are source of economical data which includes:

1. Amount and structure of revenue and expenses;
2. Detailed structure of assets, equity and liabilities.

Currency: USD or USD equivalent of company's domestic currency

Capital return and financial fragility analysis is allowed

Objectives

Advanced energy technologies, first of all it is renewable sources and ecologically clear energetics, sustainability of technological development needs of amount financial resources.

Objectives:

1. Estimate financial capability of companies to solve these tasks
2. Show regional features and differences of its financial positions and potentials.

Methods: empirical data analysis, cluster analysis.

Leverage induces systematic risk

1. «Economists... have regarded the interest rate as the most important variable in the economy. But in times of crisis leverage is far more important» (Geanakoplos, 2010).
2. Leverage induces systematic risk despite the risk reduces policies (Polenda at. al., 2014)

Geanakoplos J. (2010). The leverage cycle. NBER Macroeconomics Annual 2009, Vol. 24, University of Chicago Press, pp. 1-65.

Poledna S., Thurner S., Farmer J. D., Geanakoplos J. (2014). Leverage-induced systemic risk under Basle II and other credit risk policies. Journal of Banking & Finance, 42, 199-212.

Capital structure

Financial fragility characterised by Leverage $= L/E$,
where
E - Equity;
usially $L = L_i$ - interest bearing debt (short- and long-term) only
my approch $L = L_i + L_F$ - total other long-term liabilities (i.e. pension, tax and other provision).
Collateral form of leverage $= L/A$ (A - total assets)

Average share of "implict" long-term liabilities $L_F/L \approx 0.4$

Capital return

Capital return.

Traditional ratio is ROE. But it can levered. Thus:

$$\text{ROCE (Return on capital employed)} = (\pi - e_i)/(E + L)$$

where:

π - Net income;

e_i - Interest expenses.

This ratio is independent from capital structure

Sample: regions, companies

Region	Num. of comp.	Biggest companies
USA	34	Exelon, Duke Energy, NextEra Energy
EU	24	E.ON, Enel, GDF Suez
Japan	12	Tokyo EP, Kansai EP, Chubu EP
China	19	Datang IP, Huaneng EP, Huadian IP
India	5	NTPC, GAIL India
Asia	9	Korea EP, Tenaga Nasoinal
Can & Aus	4	Fortis Canada, Origin Energy
Russia	7	Rosseti, Inter RAO
Latin	8	Eletrobras, Enersis
Total	125	

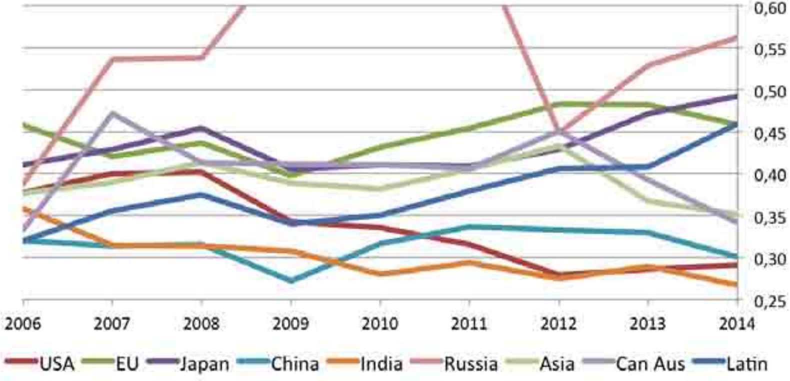
Data duration: from 2006 to 2014

Assets, sales amount (2014)

Region	Num. of comp.	Assets	Sales
USA	34	1 334 496	397 851
EU	24	1 765 774	810 458
Japan	12	427 637	210 351
China	19	438 637	124 983
India	5	121 104	32 332
Asia	9	375 242	131 847
Can & Aus	4	78 453	26 770
Russia	7	71 253	40 019
Latin	8	146 713	67 316
Total	125	4 759 309	1 841 927

Total assets turnover

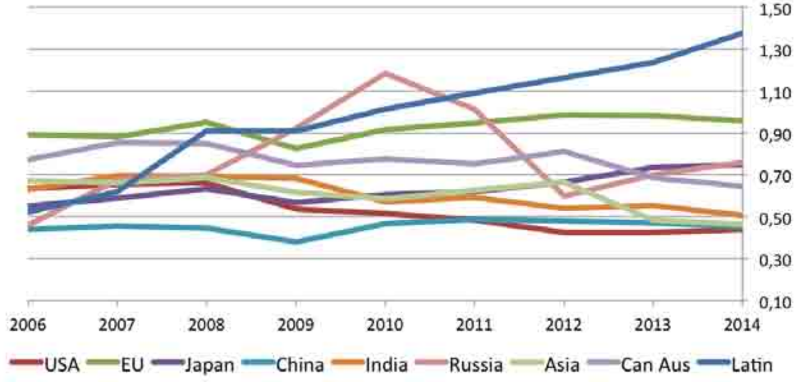
Assets turnover = Total Sales / Total Assets



Russia 2009-2011: data defect («big reorganization after privatization»)
«Stable outsiders»: USA (from 2010), China, India

Total PPE (net) turnover

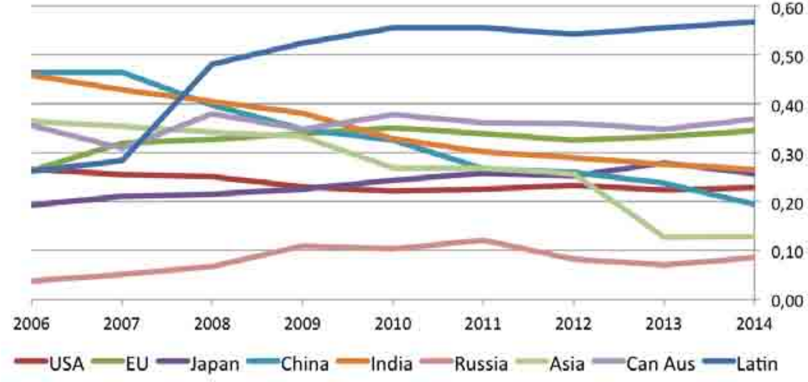
PPE turnover = Total Sales / Total PPE, net



«New leaders»: Latin America, EU, (and Canada-Australia before 2013)
Why? Because thay have significant part of energy assets in financial form

Financial assets share

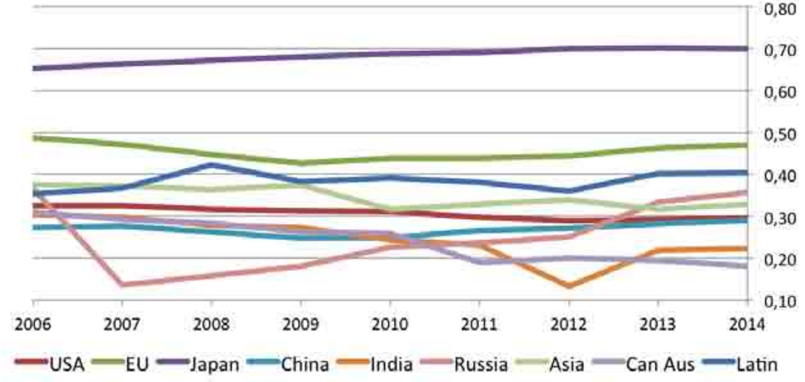
= 1- (Total PPE, net / Total Non-current assets)



Canada-Australia companies have significant average share of financial assets but poor performance of it

Depreciation rate

= Total accumulated depreciation / Total PPE, gross



Depreciation rate is quite stable in time from country to country. It probably expresses accounting policy traditions but not real level of PPE depreciation.

Data summary intermediate conclusion

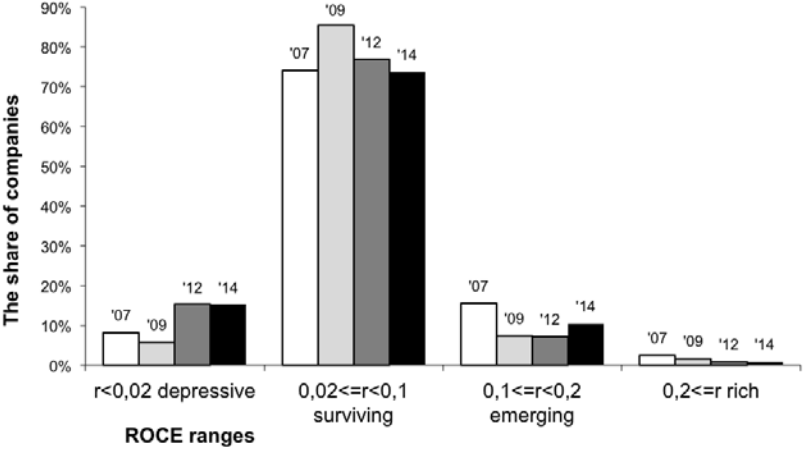
1. Energy utility companies typically have low level of financial assets.
2. Dynamics of financial parameters are quite stable in time.
3. Depreciation is an restricted source for investments to advanced technologies. It funds current renewing requirements only.
4. World financial crysis 2008-2009 put no visible outcomes on investment and performance capability at aggregate level

Financial capacity of companies: time slices

Financial capacity of companies research bases on four time slices for more detailed analysis:

- 2007 - before financial shock of 2008;
- 2009 - financial shock («industrial echo»)
- 2012 - after financial shock
- 2014 - before oil price fall

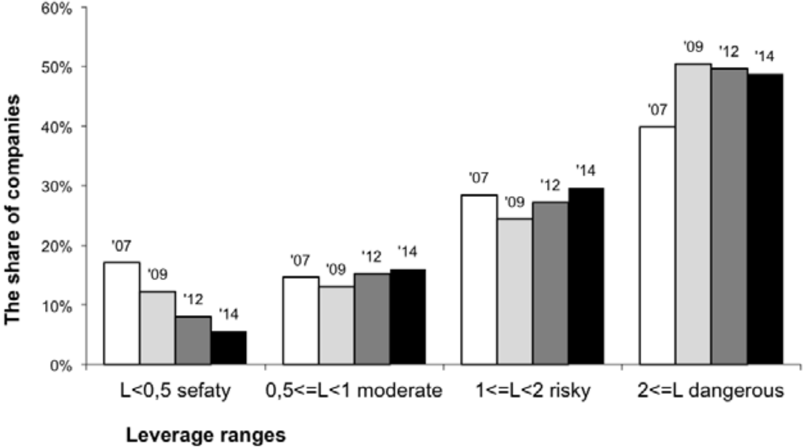
Return on capital employed: data



More then 70% of companies includes into «surviving» range
«Migration». 2009: half of emerging into surviving.

2012: depressive doubed from surviving.

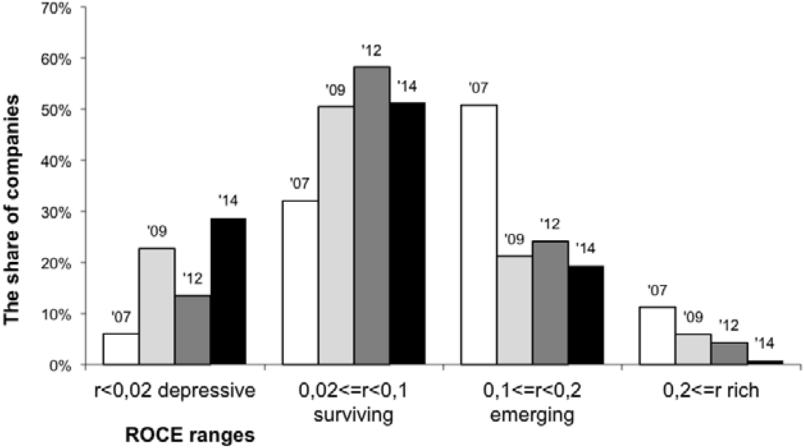
Financial leverage: data



«Migration». 2009: +10%% in dangerous range.
Sefaty: falls by 4-6%% per time step.
Risky: grows on 3%% per step from 2009

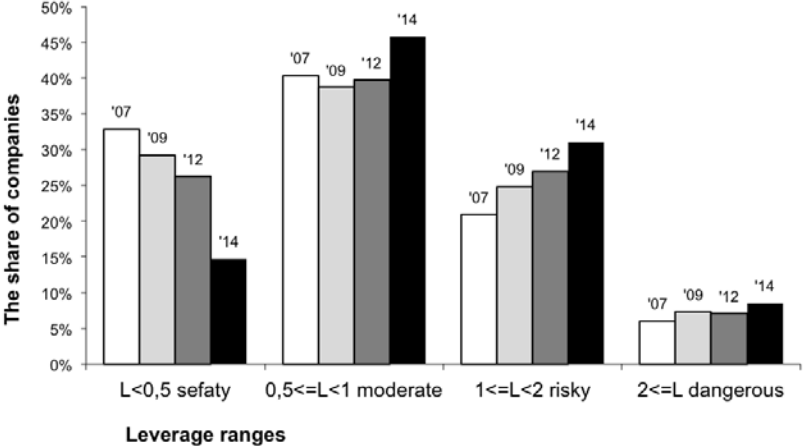
ROCE: oil and gas sector

Couldn't energy sector have ROCE-Leverage structure typical for long-term investment cycle? Probably not.



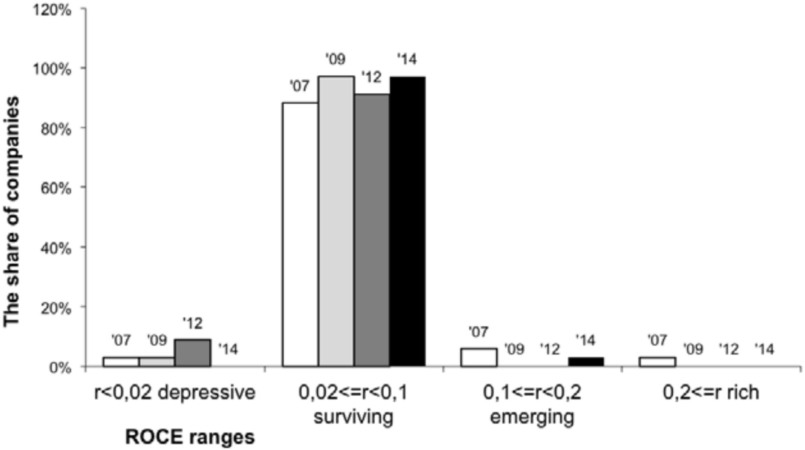
This figure demonstrate ROCE structure for oil and gas sector

Leverage: oil and gas sector



Leverage sructure is completly different form energetics

ROCE: USA (34 companies)



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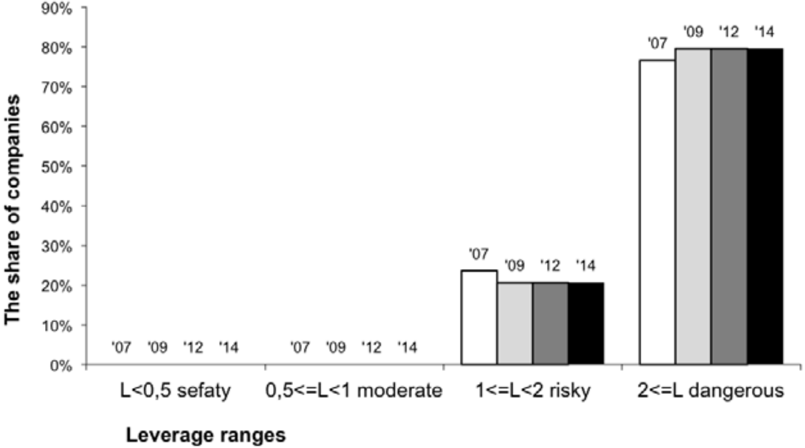
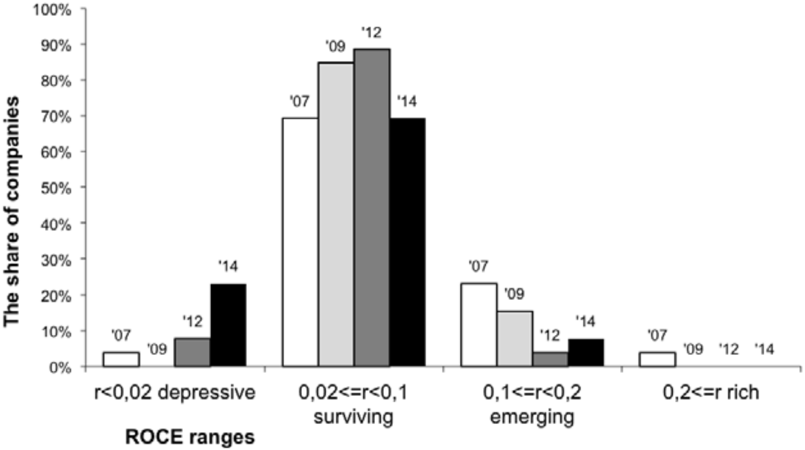
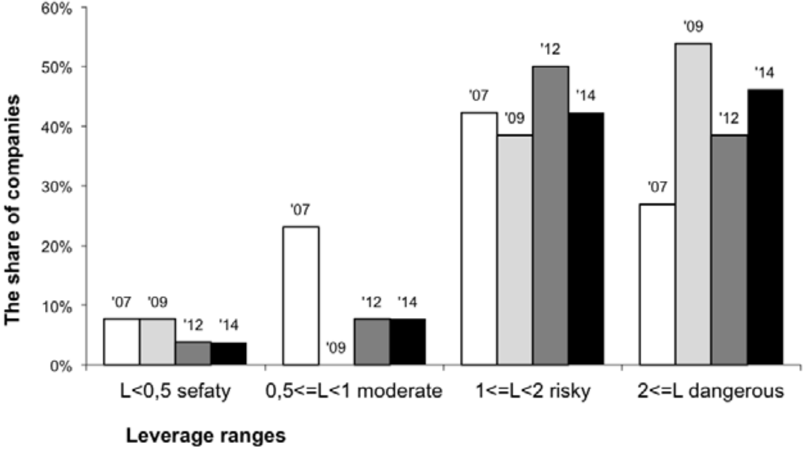


Compact group of companies with no changes in time

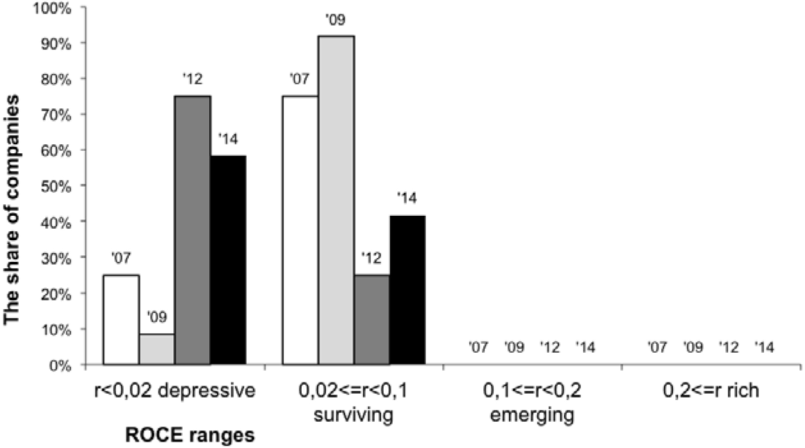
ROCE: EU (24 companies)



Leverage: EU (24 companies)

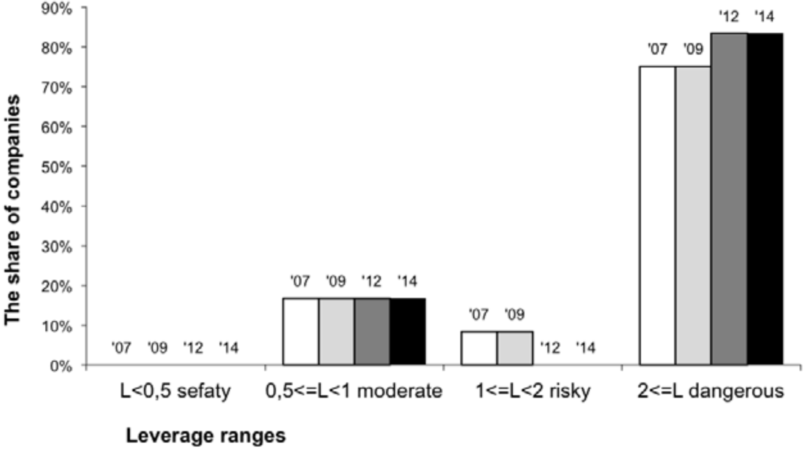


ROCE: Japan (12 companies)

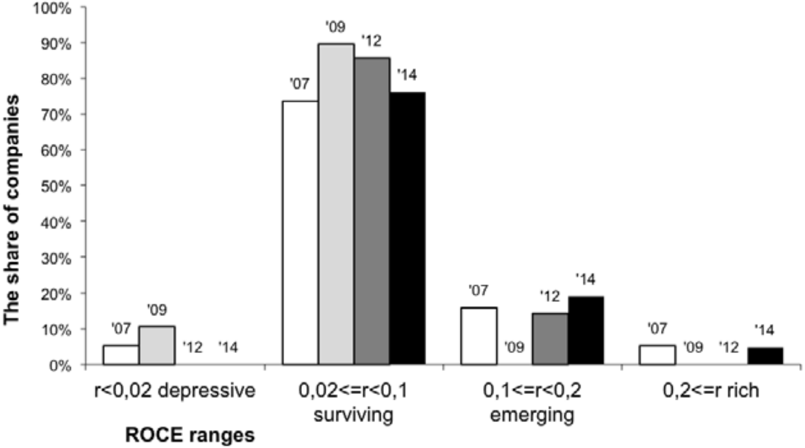


2012-14: the consequences of Fukushima

Leverage: Japan (12 companies)



ROCE: China (19 companies)



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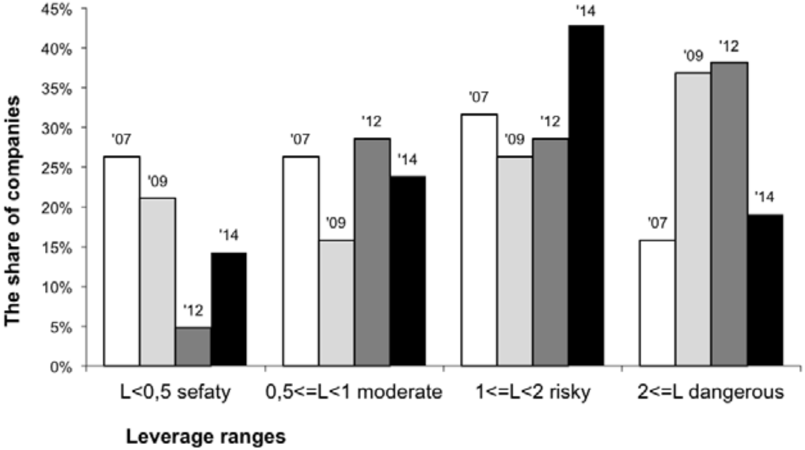
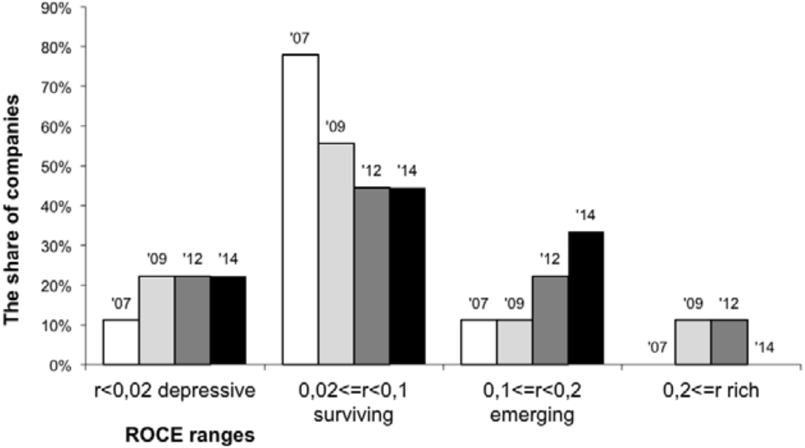


ROCE: Asia (9 companies)



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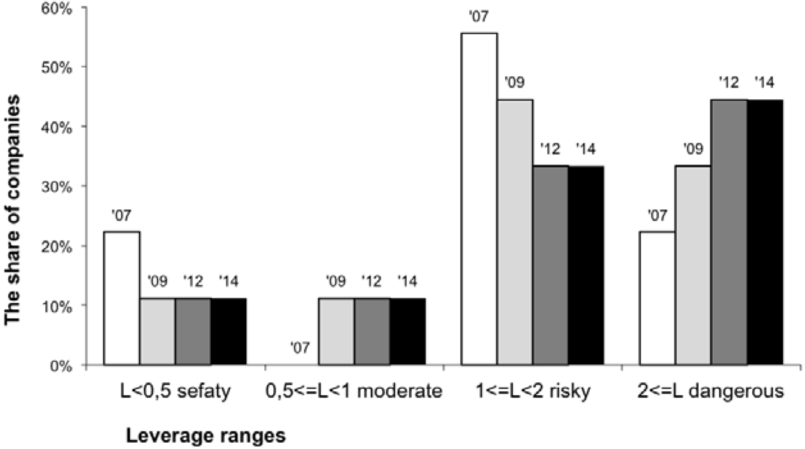
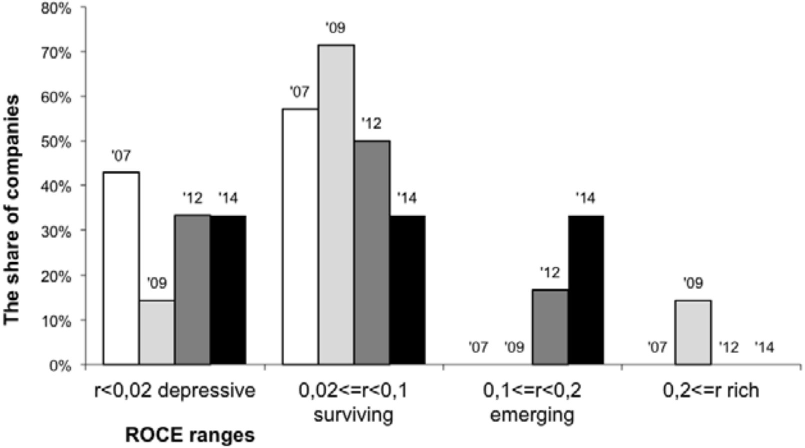


ROCE: Russia (7 companies)



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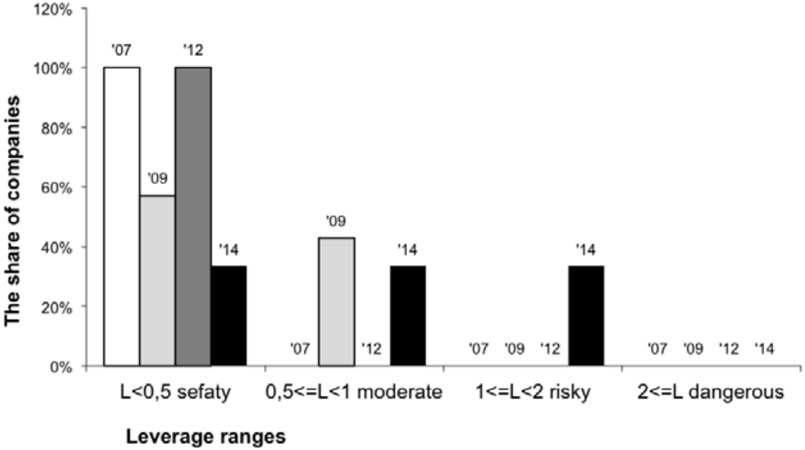
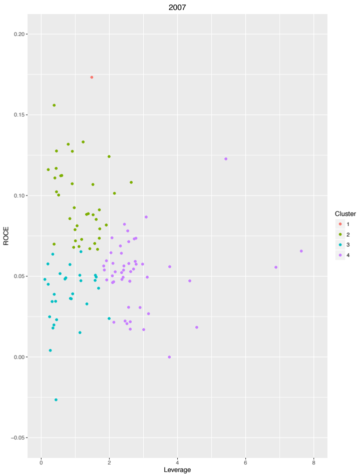
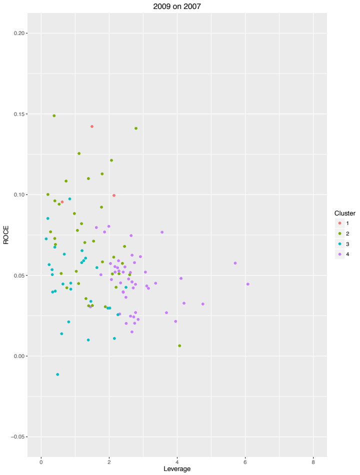


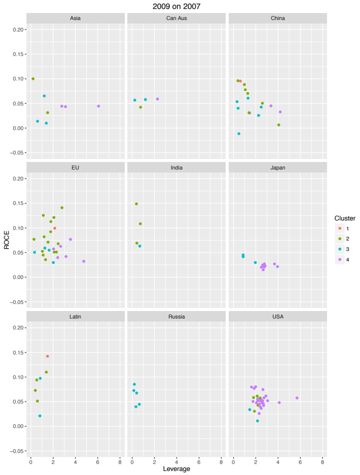
Leverage - ROCE clusters 2007



Clusters: 1 - «rich» (3 companies only); 2 - «profitable»; 3 - «survival»; 4 -« levered»

Leverage - ROCE 2009 data on 2007 clusters



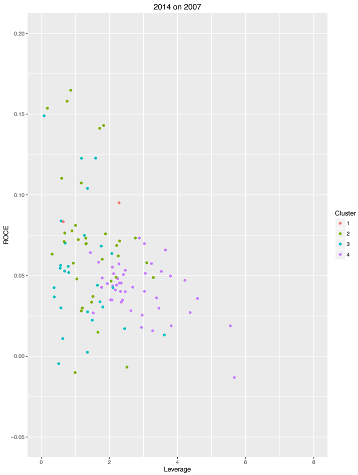


Down-right diffusion of «profitables»

Leverage - ROCE 2012 data on 2007 clusters

«Down-right diffusion» continue

Leverage - ROCE 2014 data on 2007 clusters



Almost all «profitable» cluster disappeared into «survival»and «levered» clusters

Conclusion

1. Most energy companies are low or moderately profitable with downward longterm trend.
2. Energy companies are highly levered, most of them are from USA, EU and Japan.
3. Thus companies have low financial capability both own and borrowed funds especially for development of modern energetical technologies.
4. Regional differences between companies are not so strong as sector-based specifics.