ICT Effects and Enhancing Risk Management Information System (RMIS) in Medical Sector in Vietnam

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Abstract

Measuring risk in medical sector in order to propose recommendation s is among concerns of scientists in recent years.

In specific, using quantitative and analytical methods, author analyze ICT effects and IT applications in medical sector an hospitals, as well as analyze risk information to propose solutions to enhance risk management information system for Vietnam medical sector.

Research findings show us that in order to give suitable suggestions for policy implications, firstly, study recognized that lower risks shown by beta values (< 1) among 57% of listed firms with lower risk.

Last but not least, study stated that technology applications in medical sector can help doctors and nurses to manage, store and access better data and documents of patients. And Vietnam hospitals need to enhance more Risk management information system with strong support from IT (information technology) so that we could constantly improve service quality patient services, as well as build a favorable working environment for staff both professionally and professionally, etc.

Keywords

RMIS, ICT Effects, Vietnam, Hospitals, Patient, Risk Management Information System, Medical.

JEL Classification: G100, G390.

Introduction

Authors conduct this study to estimate risks of medical sector in three groups: based on beta data of 14 listed firms in which we classified into 3 groups of firms: medicine, medical equipment, & human resource firms in order to conduct analysis of un-diversifiable risk taking place in the financial crisis 2007-2011.

In recent years people recognized the healthcare industry as one of complex and ever-evolving sectors, and professionals (healthcare sector) face a multitude of risks in jobs at hospitals every day. So, When they focus on providing the best care to their patients, they may not realize the risks they face.

Author has structure the study with background, issues to research and literature, then method and findings, discussion and conclusion.

Research Issues

With the 3 groups of firms as we selected above (see introduction part) we will conduct this research aiming to address some issues as following:

a. Issue 1: What are real situation of risks in 3 groups?
b. Issue 2: What are IT, ICT effects in medical sector and hospitals?

We also mention below hypotheses:

Because of financial recession, there should be high disperse distribution in beta values in above 3 groups of firms.

Literature Review

Marcin, Mariusz, Marek, and Karol (2012) mentioned in developing markets, calculated betas are relevant to the investors' valuation. And Huy, D.T.N (2015) mentioned there are good standards for listed companies and management.

Huy, D.T.N., Loan, B.T.T., Anh, P.T. (2020) stated we can use econometric to estimate effects of macro on bank stock price/bank performance.

Net we look at studies:

Table 1 Summary of related studies

Authors	Year	Content, result
Fama, Eugene F., and French, Kenneth R.	2004	Stock return can be affected by 3 factors, in which "value" and "size" are significant components
Luis E. Peirero	2010	In short term it is more difficult to collect beta data, and hard to measure cost of equity as well.
Xiaowei Kang	2012	Beta strategies (alternate) can help to reduce risk
Wolfgang, Lukas and Ranko	2013	Comparing to UK stock market, German stock exchange more sensitive (responding) to volatility changes (implied)
Mo Chaudhury	2011	In crisis 2008 they found out weak correlation between stocks
NN Thach, N Van Bao, DTN Huy, BD Thanh, LTV Nga, TT Ha, NT Binh	2020	Vietnam bank system has passed low inflation time 2015-2017 in which authors used quantitative model to estimate market risk volatility
Hac, L.D., Huy, D.T.N., Thach, N.N. et al	2021	OLS regression in an econometric model can help Vietnam banks to measure and have better risk management

(Source: author synthesis)

Conceptual Theories

As shown by traditional estimation method, B**eta β, i**s known as market risk measure, coming from market factors which is on contrary to internal risk that considered from firm internal factors.

Methodology

Not only author uses qualitative and inductive method, but for quantitative model, the study also uses market data and stock price to estimate variability in monthly stock price.

Then we get the results calculated of beta values for above 3 groups of firms.

Empirical Findings and Discussion

1. Statistical Results

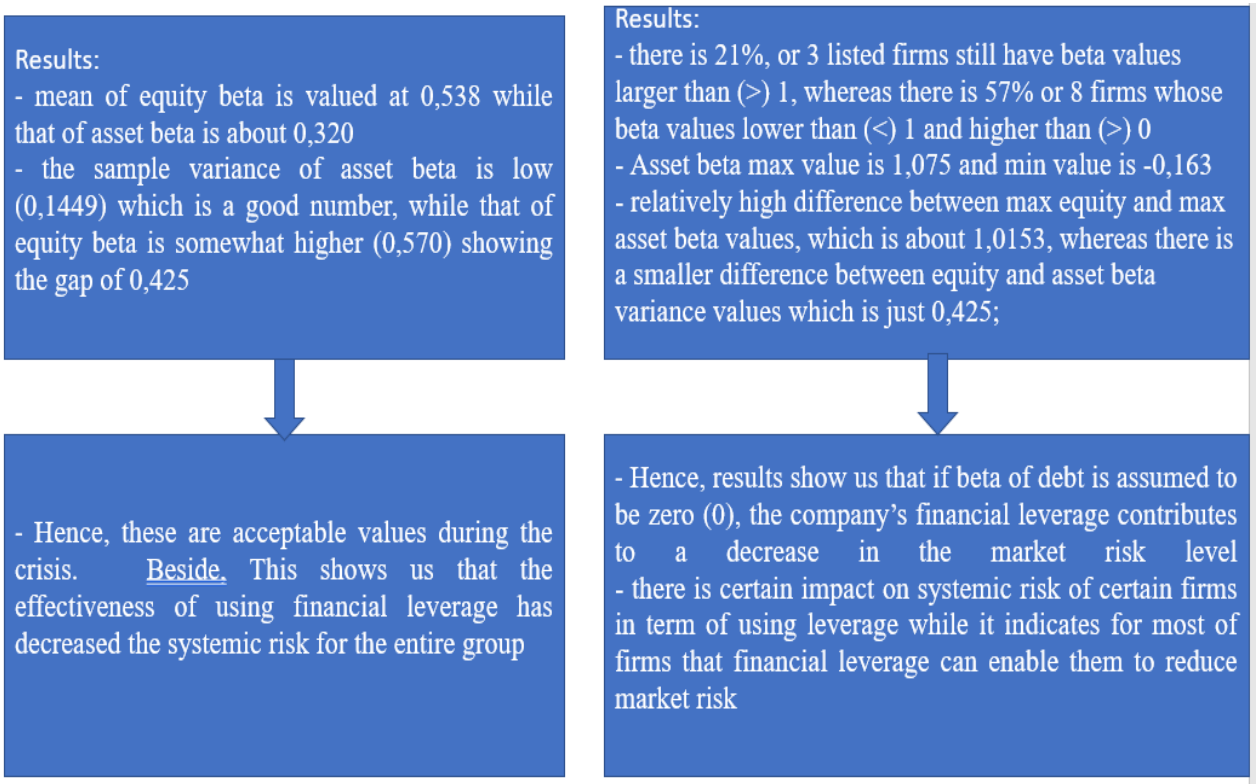

Figure 1 Analytical results

(Source: author analysis)

Not quite big effect from leverage is recognized by the gap between company's beta variance values.

Table 2 3 groups of firms with Beta values estimated

Statistic results	Equity beta	Asset beta (assume debt beta = 0)	Difference
MAX	2,091	1,075	1,0153
MIN	-0,946	-0,163	-0,7831
MEAN	0,538	0,320	0,2177
VAR	0,5700	0,1449	0,4250
Note: Sample size : 14			

(Source: author analysis from stock market)

Table 3 Leverage and beta values in the survey of 14 firms

Equity Beta	No. of firms	Financial leverage (average)	Ratio
<0	3	76,09%	21%
0<beta<1	8	55,07%	57%
Beta > 1	3	36,44%	21%
total	14	47,1%	100%

Asset Beta	No. of firms	Financial leverage (average)	Ratio
<0	3	76,09%	21%
0<beta<1	10	54,02%	71%
Beta > 1	1	9,72%	7%
total	14	43,0%	100%

(Source: author analysis from stock market)

Comparing results of above 3 groups of firms beta:

Firstly, lowest beta values belong to medical sector, and highest beta values belong to medicine sector group (shown in chart 1 below)

Secondly, we recognize because of leverage (finance) undiversifiable risk has been lower.

Thirdly, higher risk recognized in medicine sector group, compared to the other two.

Fourthly, lowest variability of beta shown in the medical equipment sector group.

Last but not least, a bit lower beta recognized in the above 3 groups of firms, compared to construction firms.

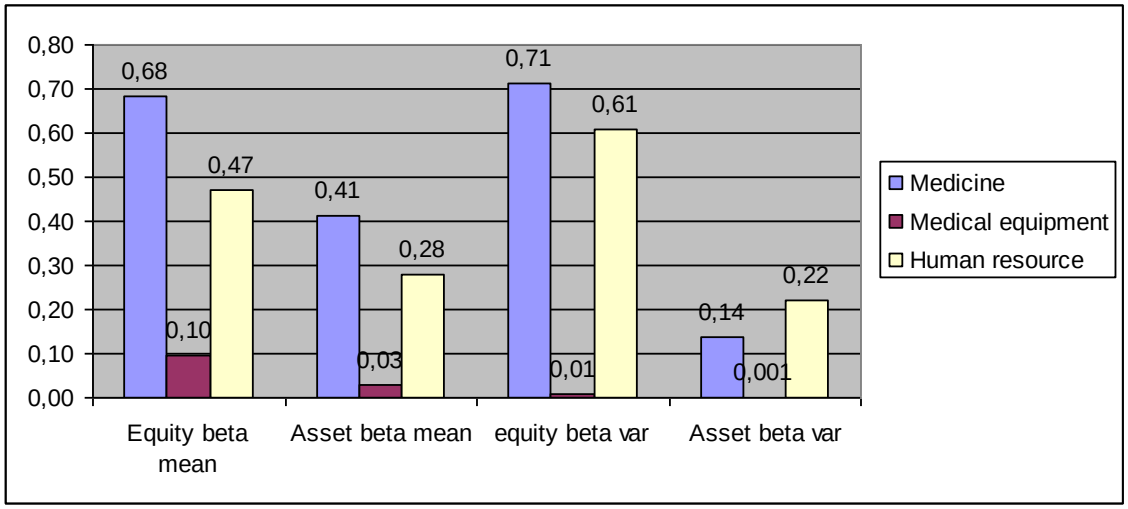

Chart 1 Statistical results of three (3) groups of 14 listed VN medical equipment, medicine and human resource firms during/after the crisis period 2007-2011

Discussion

Then, We can compare to other industries beta below:

First, a bit lower of value of asset beta mean is recognized when we compare to that of other industries: real estate firms, for instance.

Second, the importance of leverage (finance) is emphasized during crisis which has less impact of researched firms.

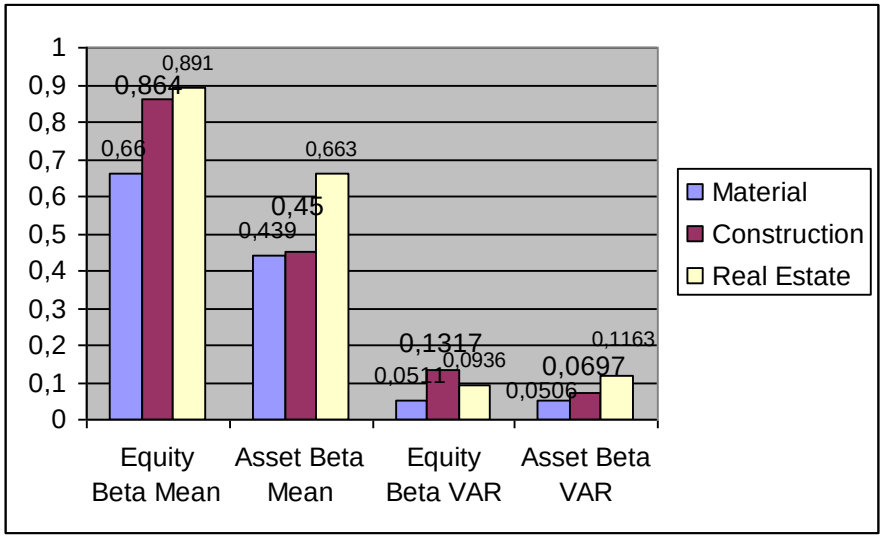

Chart 2 Statistical results of three (3) groups of 103 listed construction firms during crisis period

2. ICT Effects in Medical Sector

The Ministry of Health has issued a plan to deploy electronic health records to implement Resolution No. 20-NQ/TW (25/oct/2017) of the Party Central Committee. Expanded vaccination software, over 6.2 million vaccinated subjects managed; Pharmaceutical industry databank has been made publicly.

Regarding the application of medical robots, which are applied in a number of large hospitals-spine surgery robot, Makoplasty knee and hip surgery robot, and neurosurgery robot, etc.

Completing the hospital management information system (Hospital Information System (HIS) is the top priority in implementing IT applications of the hospital, followed by the laboratory management system (LIS), management system for storing and transferring images (Pix Archiving and Communication system, RIS/PACs),... Information systems must be integrated in order to exchange data smoothly to form a homogenous system. ensure accuracy, completeness, meet management and professional requirements, and serve patients. The integrated information system must comply with the prescribed data communication standards (Circular 53/2014/TT-BYT on 29/dec/2014); comply with the codes used in the system (Decision 2035/QD-BYT dated 12/06/2013 and Decision 4858/QD-BYT dated 3/12/2013); comply with the code of the shared list (Decision 3465/QD-BYT dated 08/07/2016).

Conclusion and Policy Suggestion

Population growth and importance of medical services to people still key drivers for medical sector in Vietnam, despite of other difficulties from covid 19 pandemic and human resource issues.

Beside, Medical firm leaders need to manage other risks as well:

Cash flow (net) of medical firms can be affected by risks such as risks coming from competitors as well as same services offered to patients and also, material price increasing year by year.

One more time, we see evidence showing us that : medical equipment industry has both the lowest equity/asset beta mean values and the lowest asset /equity beta var (see charts above). Whereas highest beta mean value as well as var of equity beta is recognized in

medicine sector group. Also the beta variance shows a small dispersion and smaller than, esp., medicine firms, under leverage impacts.

Policy Implications

After difficulties in the crisis, covid 19, we need policies to support companies and internal investors, and stabilize inflation.

Management Implications

Vietnam hospitals need to enhance more Risk management information system with strong support from IT (information technology).

Promoting the application of information technology (IT) in all hospital activities towards building a smart hospital is the responsibility of hospital leaders. Based on the actual situation of the hospital, list IT applications in order of priority that need to be implemented towards four specific goals, including: (1) constantly improving service quality patient services, (2) building a favorable working environment for staff both professionally and professionally, etc.

Limitation of Research

Author could expand more details in hospital and technology.

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Exhibit

Exhibit 1 – Interest rates, Inflation, GDP growth and macroeconomics factors

Year	Basic rates	Lending rates	Deposit rates	Inflation	GDP	USD/VND rate
2012	n/a	12% - 15%	9%	6,81%	5,03%	20.828
2011	9%	18%-22%	13%-14%	18%	5,89%	20.670
2010	8%-9%	19%-20%	13%-14%	11,75% (Estimated at Dec 2010)	6,5% (expected)	19.495
2009	7%	9%-12%	9%-10%	6,88%	5,2%	17.000
2008	8,75%-14%	19%-21%	15%-16,5%	22%	6,23%	17.700
2007	8,25%	12%-15%	9%-11%	12,63%	8,44%	16.132
2006	8,25%			6,6%	8,17%	
2005	7,8%			8,4%		
Note	Approximately (2007: required reserves ratio at SBV is changed from 5% to 10%) (2009: special supporting interest rate is 4%)					

(Source: Viet Nam commercial banks and economic statistical bureau)