

ANALYSIS OF THE REASONS THAT DETERMINE TURKISH NURSES' PREFERENCE OF WORKING ABROAD BY PROBIT MODEL

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ABSTRACT

It was detected that the variable having the highest positive effect is age variable. The older they are the less they prefer to work abroad. The factors which motivate nurses to prefer a job abroad include being a university graduate, being a male, having at least one child, having a monthly income higher than 2000 TL (USD/TRY 1.7810), longer weekly working hours in Turkey. On the other hand, being less-experienced negatively affects the preference of working abroad. The less experienced they are the less they prefer to work abroad.

Keywords: Foreign nurse, foreign nurse candidates, foreign-trained nurses

1. INTRODUCTION

Foreign nurses constitute a major part of human resource and especially of qualified health personnel. It is seen that in recent times, global healthcare organizations have tended towards foreign nurses. The reason is that the healthcare system encounters great problems in many countries due to lack of nurses. Such countries solve this problem by importing foreign nurses. It has been a popular method recently. The most severe crisis of the global health sector is qualified human resource shortage. It is seen that the countries where the shortage is experienced most are developed countries. Foreign nurses prefer to work in other countries due to social, political and economic stability. Foreign nurses are beneficial not only to the countries where they work but also to their own country. Foreign nurses shall have increased their level of knowledge, skills and professionalism when they return home from the countries where they work. Thus, they make great contribution not only to the delivery of quality health services in their own country but also to the economic development of their own country because of the high salary they receive. However, for the purpose of delivering quality health services in underdeveloped countries, labor force drain to developed countries has to be stopped through human resources policies although it is beneficial (Blouin, 2005; Gostin, 2008).

Nurse import is regarded as a beneficial strategy against blocked labor force. However, institutions shall have to double the effort they make to retain the nurses they have if no measure is taken in the next twenty years. For this reason, suitable human resources policies should be developed and implemented in advance so that the global health sector does not have difficulty in the future. Both domestic and foreign hospitals prefer foreign nurses with the thought that they are more economic. Foreign nurses are a reaction to nurse shortage by force of global and local nurse labor force policies. The United States of America is the country that employs the highest number of foreign nurses in the world. The United States of America Health and Human Services Department (HHS) considered that, in the first 20 years of the 21st century, the country population would increase by at least 18% and the elderly population (aged 65 and older) would increase threefold. It stated that the need for nurses would be 275.000 as of 2010. It predicts the need for nurses to be 800.000 for 2020 (Brush et al., 2004).

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Nurse shortage is one of the primary problems of healthcare organizations. Nurse migration plays a significant role in eliminating nurse labor force imbalance. It is seen that the foreign nurse market has gradually grown especially in industrialized countries. It is perceived that foreign nurses prefer global healthcare organizations for professional development and personnel safety. It is seen that the core element that increases competition in the global health sector market is nurses. Moreover, it is observed that nurse shortage is a factor effective in the increase of health costs and the creation of excessive workload. At the same time language is an important factor in the determination of the country to which foreign nurses shall go. On the grounds that speaking a language fluently is highly important for nurses in patient care, nurses rather prefer to go to the countries in which their mother language is spoken. For foreign nurses, the global health sector has not only advantages but also disadvantages. One of them is to be exposed to discrimination due to religion, race and color and to experience double standard in the country they go (Kingma, 2007).

Globalization increases the difference between rich and poor countries. In consequence of this difference, nurses have been obliged to migrate from one country to another having better living and working conditions. It is seen that the leading factor that is effective in migrating from one place to another for nurses is global communication devices and transport vehicles. Global communication devices and transport vehicles are cheap and easy-to-use. For this reason, nurses are able to easily establish communication and network with the people in the countries from which they come. Thus, it may be easier for nurses to migrate from one place to another. Depending on the type of works they perform in the countries they go, nurses are classified as permanent, voluntary, transit and idle. In permanent status foreign nurses go to a country with their family and stay permanently and work there. In voluntary status, nurses work in temporary works that arise out of necessity like seasonal workers. However, in transit status, nurses transit from one position to another. Finally, in idle status, nurses work due to a need as a result of excessive workload (Haour & Davies, 2008).

Nurse shortage puts global health initiatives in developed countries in jeopardy. Developed countries plan to overcome this problem in two ways. The first one is to increase the number of sustainable local nurses while the second one is to invest in nurse training capacity in underdeveloped countries and try to overcome this problem. Thus, underdeveloped countries become the nurse supplier of developed countries. Both supplier countries and immigrant-receiving countries meet the human resource needed/to be needed by the world health services. At the same time, nurse shortage in developed countries helps to the acceleration of nurse migration and retaining activities. However, the number of qualified nurses supplied from underdeveloped countries may fall short in the next years. So, it is required to make necessary investments in human resources to be needed by the global health sector. Developed countries have to make necessary investments not only in the nurses in underdeveloped countries but also in their own nurses. Otherwise, it is explicit that no good results shall be taken from the health services that are rendered only by foreign nurses (Aiken et al., 2004).

Three main findings emerge from the OECD/WHO (2010) work with regard to the impact of health workers' migration on origin countries. First, a significant share of international movements is occurring between OECD countries. Around 2000, nurses born in the Philippines (110 000) accounted for the bulk of the immigrant health workforce in the OECD. But the second and third most important origin countries were the United Kingdom and Germany. As of 2000, slightly fewer than 30% of migrant nurses in OECD countries originated from another OECD country. For healthcare, the most important labor force of global human resources is nurses. The objective of this study is to analyze the factors that determine the preference of the foreign nurses who constitute a major part of human resource for global healthcare organizations for working in global healthcare organizations.

For the success of foreign-trained nurses in the foreign nurse labor market, it is required to make necessary investments in nursing schools and prepare curriculums that are compatible with other countries' curriculum. It is of great importance to make such regulations so that nurses pass the exams to

be made in the countries where they shall work. Moreover, nurses should adapt themselves to working conditions. It is seen that nursing schools play a crucial role both in training the foreign nurses who fulfill working conditions in another country and meeting the deficit of nurses needed by the global market. For this reason, it is necessary to considerably increase the level of support given to nursing schools (Aiken, 2007).

2. GLOBAL HEALTH SECTOR AND NURSES

Global health is a multidimensional term that contains the social, political, economic, technological, environmental and cultural matters which affect health and healthcare all around the world. Global health is accepted as an area of application and research of all disciplines and consequently nursing. Given the aforementioned, it is seen that it is compulsory to organize undergraduate, graduate and postgraduate education programs in nursing in such a way to cover regional, national and global health (Kaya, 2010). Health sector needs adequate number of well-trained and well-motivated nurses for the purpose of providing patients with high-quality and safe health service. It is seen that the said need increases day by day depending on economic developments, increasing and aging population, technological progress, increasing patient expectations and ill or injured nurses. It is perceived that some of the countries meet the increasing demand by employing foreign nurses. The host country is required to develop some policies so that foreign nurses can work in another country. Such policies include regulations that allow foreign nurses to work in another country, certification processes and visa procedures. On the part of foreign nurses, however, the biggest problem is language. Today, it is observed that many countries meet their nurse deficit by employing foreign nurses. It is one of the advantages of globalization in the health sector. It is also of paramount importance not only to employ in foreign countries but also to retain nurses who play a key role in rendering quality health service. Otherwise it is seen that excessive workload, long working hours, insufficient salary, discrimination, insufficient social support increase the rate of turnover for foreign nurses (Simmons et al., 2005).

Foreign nurse migration means brain drain from one country to another with the demand of personnel safety and quality living. It is seen that foreign nurse brain drain negatively affects supplier countries socially, politically, economically, technologically, environmentally and culturally. It is explicit that nurse migration from underdeveloped countries to developed countries takes place due to reasons such as income, better working conditions, learning, application and career opportunities, job security, living conditions, opportunities for family members, language, cultural similarity/difference, religious similarity/difference and climate. However, today, foreign nurse migration is not only to developed countries but also to regions such as Asia, Africa and Caribbean. Experienced nurse shortage (i.e. foreign nurses) is one of the strong demands of the global market and especially industrialized countries. The said demand of the global market is satisfied by using the strategy of either bringing foreign nurses from abroad or employing student nurses in shifts or full-time. It is perceived that the most important problem of the global health sector is nurse shortage due to imbalanced distribution of nurses. This problem may be solved through international employment policies (Kingma, 2001).

As developed countries make up their shortage of personnel by importing foreign nurses from underdeveloped or developing countries, they harm both the economy and the health system of the countries from which nurses come. The reason is that the investments made for training skilled nurses go down the drain. Moreover, the health system of nurse exporting countries weakens. Furthermore, inequities occur in the distribution of nurses in the world and concentrations are encountered in certain regions. The United States of America, England, North Europe countries, Australia, New Zealand and North East Asia countries are the primary nurse importing countries of the world. For the countries that experience nurse shortage potential solutions should be curriculums adapted to new social and economic conditions rather than nurse migration (Ivkovic, 2011). Besides, national policy makers have to take a number of measures to maximize human resource in nursing in order to make up the nurse shortage. Such

measures should include nurses' working conditions, educational opportunities, incomes, professional developments, career opportunities and extended powers.

3. RESEARCH METHODOLOGY

3.1. Objective of the Study

The subject of analysis in our study is nurses. Nurses constitute a major part of the human resource of the global healthcare organizations. The reason is that they are many in number in health services offer and they come into contact with patients most. Increasing and ageing world population increases the existing nurse shortage day by day. So, especially developed countries make up the shortage in question by employing the nurses in underdeveloped countries with higher salaries. Thus, developed countries make up their nurse shortage by means of foreign nurses on the one hand and cause high health costs because of employing foreign nurses with higher salaries on the other hand. The factors that determine the preference of foreign nurses who are significant in terms of both health system and economy for working in another country were considered worthy of analysis.

3.2. Target Population and Sample

The target population was comprised of the nurses who served at Bulent Ecevit University Practice and Research Hospital and Atatürk State Hospital. In data collection, questionnaire forms prepared by making use of the literature were employed. Within the framework of the study, it was ensured that for Bulent Ecevit University Practice and Research Hospital 181 nurses out of 355 nurses returned the questionnaire forms. The rate of return for questionnaires is 50.98%. As a result of the analysis, 9 questionnaires were invalidated and 172 questionnaire forms were taken under review. On the other hand, for Atatürk State Hospital the return of questionnaire forms of 115 nurses out of 184 nurses was ensured. The rate of return for questionnaires is 62.50%. As a result of the analysis, 12 questionnaires were invalidated and 103 questionnaire forms were taken under review. Stata and SPSS package programs were employed in data analysis.

3.3. Method and Technique Used in the Study

In this study, which analyzes the factors that determine the preference of nurses serving at Bulent Ecevit University Practice and Research Hospital and Atatürk State Hospital for working in global healthcare organizations, conventional questionnaire technique was preferred for collecting data. The questions of the questionnaire were prepared with the help of the information obtained as a result of literature review as closed-end questions. As assessment scale, five point likert scale which is a metrical scale was used. In the scale, 1 represents "strongly disagree", 2 represents "disagree", 3 represents "neither agree not disagree", 4 represents "agree", and 5 represents "strongly agree". The questionnaire contains questions not only about the personal and professional qualifications of the participants but also for determining their preference of working in global healthcare organizations.

3.4. Findings of the Study

Under the title of findings of the study, firstly questions were asked about participants' personal and professional qualifications such as age, gender, place of residence, number of years worked in the unit, educational background, title, unit worked, marital status, number of children, number of years worked at the hospital, number of years worked in the profession, weekly working hours, income status and whether or not nurses prefer to work in a global healthcare organization. Table 1 summarizes the distribution of the answers given by nurses to personal and professional qualifications.

Table 1: Personal and professional qualifications of the nurses who took part in the questionnaire

Definitive Statistics							
Variable		Number	Per. (%)	Variable		Number	Per. (%)
Age				Marital Status			
Younger than 30		129	46.70%	Married		163	59.30%
Between 30 and 40		115	41.80%	Single	Base Cat.	112	40.70%
Older than 40	Base Cat.	31	11.30%	Number of Children			
Gender				At least 1 child		220	79.70%
Male		29	10.50%	2 or more children	Base Cat.	53	19.30%
Female	Base Cat.	246	89.50%	Number of Years Worked at the Hospital			
Place of Residence				Less than 3 years		56	20.40%
Urban		238	86.50%	Between 3 and 7 years		121	44.00%
Rural		37	13.50%	More than 7 years		97	35.30%
Number of Years Worked in the Unit				Number of Years Worked in the Profession			
Less than 3 years		93	33.80%	Less than 3 years		41	14.90%
Between 3 and 7 years		121	44.00%	Between 3 and 7 years		121	44.00%
More than 7 years		61	22.20%	More than 7 years	Base Cat.	113	41.10%
Educational Background				Weekly Working Hour			
High school and college	Base Cat.	90	32.70%	49 or less	Base Cat.	108	39.70%
Bachelor Degree		171	62.20%	50 or more		164	60.30%
Master's Degree		14	5.10%	Income Status (TL)			
Title				Less than 2000	Base Cat.	96	34.90%
Head nurse and assistant nurses		5	1.80%	More than 2000		177	64.40%
Charge nurse		45	16.4%	Would you like to work at a hospital abroad or at a foreign hospital having a branch in Turkey			
Service nurse		225	81.8%	Yes		201	73.10%
Unit Worked				No	Base	74	26.90%
Intensive care		54	19.60%				

					Cat.		
Internal units		99	36.00%				
Surgical units		99	36.00%				
Administration and others		22	8.00%				

According to this table, the age of participants is generally below 30 and female nurses constitute the majority by 89.50%. Moreover, nurses live in city centers and their period of service ranges from 3 years to 7 years in general. 62.20% of the participant nurses have bachelor degree and 81.80% of them are service nurses. Besides, nurses working in internal and surgical units constitute the majority of the participant nurses. Nurses are generally married and have one child and have worked at the hospital and in the profession for 3 to 7 years. Their weekly working hours are 50 hours and more and their income status vary from 2000 TL to 3000 TL (1USD=1.7810 TL). To the question whether or not they want to work abroad, 73.10% of them answer “yes” and 26.90% of them answer “no”. Those who answer “yes” are generally younger than 30 while those who answer “no” are generally older than 30.

3.5. Probit Regression

If it is accepted in the studies where a dichotomous dependent variable is explained that the cumulative distribution function used for estimation belongs to “normal distribution”, then Probit model emerges (Greene, 2002; Wooldridge, 2002). The objective of this study is first to explain the preference of the nurses serving at Bulent Ecevit University Practice and Research Hospital and Atatürk State Hospital for working at a hospital abroad and then to analyze the factors which determine such preference. To that end, probit model was estimated. Table 2 demonstrates the results of the probit model if the dependent variable is taken as “nurses’ preference of working at a hospital abroad”.

Table 2: Probit Regression

Independent Variables	Dependent Variable: Nurses’ Preference of Working in A Hospital in Foreign Countries			
	Coef.	Std. Err.	Z	P> z
constant	-1.560	0.414	-3.77	0.000
Age (<30)	1.988	0.409	4.86	0.000
Age(30-40)	1.155	0.346	3.33	0.001
Gender (Male)	0.761	0.437	1.74	0.082
Marital Status (Married)	0.191	0.237	0.81	0.420
Being a University Graduate	0.505	0.207	2.43	0.015
Getting a Master’s Degree	0.307	0.463	0.66	0.507
Having a Child	0.361	0.273	1.32	0.187
Monthly Income Limits (more than 2000 Turkish Liras)	0.622	0.201	3.26	0.001
	0.305	0.201	3.09	0.002
Working Time Limits (more than 50 hours a week)	-1.008	0.294	-3.42	0.001
	-0.322	0.275	-1.17	0.241
Work Experience (less than 3 years of work experience)				
Work Experience (3 to 7 years of work experience)				
LR chi2(11) = 96.45	Number of obs = 275			
Prob > chi2 = 0.0000	Pseudo R2 = 0.3011			
Log likelihood = -111.92063				

Base Categories: Age (>40), Gender (Female), Marital Status (Single), Being a Highschool Graduate, Having two or more children, monthly income less than 2000 Turkish Liras, Working Time Limits (less than 50 hours a week), Work Experience (more than 7 years of work experience)

Except for the variables of marital status, getting a master's degree, having a child and 3 to 7 years of work experience, all coefficient estimates are statistically significant at a significance level of 5%. As it is seen in Table 2, all independent variables other than work experience positively affect nurses' preference of working at a hospital abroad. Given the coefficient estimates, age variable has the highest positive effect with a coefficient of 1.9. In other words, being younger than 30 has a significant effect on nurses' preference of working at a hospital abroad. The older the nurses are the less they prefer to work abroad. The factors that motivate nurses in preferring a job abroad are being a university graduate, being male, having at least one child, having a monthly income more than 2000 TL, and longer weekly working hours in our country. On the other hand, being less experienced negatively affects nurses' preference of working at a hospital abroad. The less experience the nurses have the less they prefer to work abroad.

Table 3 gives the marginal effects in relation to the variables (relative risk ratio). As it can be understood from the data in the table, being younger than 30 increases the probability of working abroad by 52%. On the other hand, being between the age of 30 and 40 increases the probability of working abroad by 30%. Being male increases the probability of working abroad by 16%, being married by 5%, being a university graduate by 15%, having a monthly income more than 2000 TL by 19% and weekly working hours exceeding 50 hours by 10%. On the other hand, having a work experience of less than 3 years and of between 3 years to 7 years decrease the probability of working abroad by 32% and 9%, respectively.

Table 3: Marginal Effects after Probit Regression

	dy/dx	Std. Err.	Z	P> z
Age (<30)	0.520	0.096	5.40	0.000
Age(30-40)	0.305	0.088	3.44	0.001
Gender (Male)	0.166	0.064	2.57	0.010
Marital Status (Married)	0.056	0.700	0.80	0.424
Being a University Graduate	0.152	0.064	2.36	0.018
Getting a Master's Degree	0.078	0.103	0.76	0.445
Having a child	0.113	0.916	1.24	0.217
Monthly Income Limits (more than 2000 Turkish Liras)	0.191	0.064	2.99	0.003
Working Time Limits (more than 50 hours a week)	-0.320	0.098	-3.26	0.001
Work Experience (less than 3 years of work experience)	-0.094	0.082	-1.15	0.250
Work Experience (3 to 7 years of work experience)				

(*) dy/dx is for discrete change of dummy variable from 0 to 1

3.6. Principal Components Analysis

Principal components analysis and one-way analysis of variance were conducted only on the nurses who answered "yes" to the question "Do you prefer to work abroad?" In that application, the focus was on the main reasons why the nurses answered "yes". It is possible to determine the adequacy of data for principal components analysis according to different criteria. In the study, correlation coefficients between the variables were analyzed by means of the Barlett's Test of Sphericity and the Kaiser-Mayer-Olkin (KMO) Measure of Sampling Adequacy. In the Barlett's Test of Sphericity, rejection of null hypothesis indicates that the data is adequate for principal components analysis. On the other hand, the KMO Measure of

Sampling Adequacy is calculated based on simple and partial correlation coefficients. It takes values from 0 to 1. The closer the KMO Measure of Sampling Adequacy is to 1 the more adequate the data is for principal components analysis. Table 4 demonstrates the results of the Barlett's Test of Sphericity and the KMO Measure of Sampling Adequacy. According to the results obtained in the Barlett's Test of Sphericity null hypothesis is rejected at a significance level of 1%. Besides, the KMO Measure of Sampling Adequacy was found to be 0.934. At the end of the Barlett's Test of Sphericity and the KMO Measure of Sampling Adequacy, it was concluded that the data was adequate for principal components analysis.

Table 4: KMO and Barlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy	0.934
Bartlett's Test of Sphericity	
Approx. Chi-Square χ^2 [Significant]	3306.086 [0.000]

Upon finding that the data was adequate for principal components analysis, the factors that determine participants' preference of working abroad were analyzed by principal components analysis. The method commonly used in the literature for deriving factors is to consider the factors having a variance participation percentage above 1. According to the results in Table 5, three factors having a variance participation percentage above 1 were obtained. These 3 factors are capable of explaining 69.84% of the total variance.

Table 5: Explained Total Variance

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	(%) of Variance	Cumulative (%)	Total	(%) of Var.	Cum. (%)	Total	(%) of Variance	Cumulative (%)
1	11.369	56.846	56.846	11.369	56.846	56.846	6.754	33.770	33.770
2	1.447	7.234	64.081	1.447	7.234	64.081	5.712	28.562	62.331
3	1.152	5.760	69.841	1.152	5.760	69.841	1.502	7.509	69.841
4	0.810	4.049	73.890						
5	0.713	3.565	77.456						
6	0.566	2.830	80.285						
7	0.515	2.576	82.862						
8	0.510	2.549	85.411						
9	0.423	2.113	87.524						
10	0.387	1.937	89.461						
11	0.344	1.719	91.180						
12	0.310	1.549	92.729						
13	0.279	1.395	94.124						
.	.	.	.						
.	.	.	.						
.	.	.	.						
20	0.116	0.582	100.000						

For the purpose of simplifying the interpretation of factor loads, varimax factor rotation was applied. Table 6 gives the factors and factor loads obtained. In Table 6, the variables which have a factor load higher than 50% are shown. According to the results obtained, the first factor is made up of offering

career opportunities, offering learning opportunities, offering educational opportunities, offering the opportunity of learning a foreign language, better income, high-quality service, safe working conditions, gaining international experience, creating opportunities for family members, better living conditions, job safety and opportunity of living in another country and in a bigger city. This factor is called as individual reasons factor. Due to the fact that the second factor contains rather territorial characteristics, it is called as territorial reasons. The third factor includes only “unemployment” variable and called as unemployment. As a result of the principal components analysis performed, the main reasons that determine nurses’ preference of working abroad were identified as individual reasons, territorial reasons and unemployment.

Table 6: Rotated Component Matrix

Variables	Individual Reasons	Territorial Reasons	Unemployment
Offers career opportunities	<u>0.843</u>	0.316	0.027
Offers learning opportunities	<u>0.832</u>	0.285	-0.014
Offers educational opportunities	<u>0.815</u>	0.364	0.062
Offers the opportunity of learning a foreign language	<u>0.767</u>	0.310	0.083
Income is better	<u>0.755</u>	0.146	0.106
Service rendered is high-quality	<u>0.696</u>	0.397	0.145
Safe working conditions	<u>0.626</u>	0.535	0.075
Gaining international experience	<u>0.624</u>	0.467	0.180
Creates opportunities for family members	<u>0.621</u>	0.520	0.122
Better living conditions	<u>0.613</u>	0.298	0.452
Job safety	<u>0.601</u>	0.515	0.249
Opportunity of living in another country and in a bigger city	<u>0.505</u>	0.406	0.438
Religious similarities/differences	0.202	<u>0.835</u>	0.089
Cultural similarities/differences	0.263	<u>0.821</u>	-0.036
Contribution to countries’ economic development	0.300	<u>0.782</u>	0.149
Today’s transportation vehicles and communication devices are cheap and easy	0.288	<u>0.765</u>	0.113
Contribution to renewing and developing countries’ manpower infrastructure	0.440	<u>0.746</u>	0.030
Social, political and economic instability in my country	0.407	<u>0.603</u>	0.237
Customer-focused service concept and quality standard	0.491	<u>0.586</u>	-0.022
Unemployment	0.026	0.015	<u>0.919</u>

3.7. Anova

The correlation between nurses’ age, educational background and work experience differences and the factors that were obtained from principal components analysis and determine the main reasons of nurses’ preference of working abroad was analyzed by one-way analysis of variance (ANOVA). Prior to Unidirectional Variance Analysis, Levene Test was employed to analyze whether or not the group variances of age, educational background and work experience were equal for each factor. Null hypothesis which indicated that the group variances were equal was rejected at a significance level of 5%.

In the light of the information, Table 7 gives the ANOVA test results. These results demonstrate whether or not there is a significant difference in the average of the factors obtained from principal components analysis for age groups of younger than 30, between 30 years and 40 years, and older than 40. According to the results in the variance analysis table, finding a probability value higher than 5% shows that nurses’ preference of working abroad for individual, territorial and unemployment reasons does not change by

age groups. According to these results, the reasons for preferring to work abroad for nurses from different age groups are similar.

Table 7: ANOVA Test

Factors	F-Statistic	Significant
Individual Reasons	2.527	0.082
Territorial Reasons	2.660	0.072
Unemployment	2.526	0.083

It was analyzed by ANOVA test whether or not level of education created a significant difference on the factors that determine the preference of working abroad. The results are given in Table 8. According to the results in the variance analysis table, finding a probability value higher than 5% shows that nurses' preference of working abroad for individual, territorial and unemployment reasons does not change by level of education. The reasons for preferring to work abroad for nurses from different levels of education (high school, college, bachelor degree or master's degree) are similar¹.

Table 8: ANOVA Test

Factors	F-Statistic	Significant
Individual Reasons	3.032	0.050
Territorial Reasons	1.612	0.202
Unemployment	0.809	0.447

It was analyzed by ANOVA test whether or not work experience created a significant difference on the factors that determine the preference of working abroad. The results are given in Table 9. According to the results in the variance analysis table, finding a probability value higher than 5% shows that nurses' preference of working abroad for individual, territorial and unemployment reasons does not change by groups having different work experience. The nurses who have a work experience of less than 3 years, from 3 to 7 years or more than 7 years prefer to work abroad for individual, territorial and unemployment reasons. The nurses who have different work experience prefer to work abroad for similar reasons.

Table 9: ANOVA Test (EXPERIENCE)

Factors	F-Statistic	Significant
Individual Reasons	1.409	0.247
Territorial Reasons	0.212	0.809
Unemployment	2.138	0.121

4. CONCLUSION

The change experienced in political, technological, economic and social spheres with the influence of globalization has affected the health sector as well. Nurses constitute the largest group among the healthcare personnel rendering health service. With the influence of globalization, nurses are required to

¹ Nurses' preference of working abroad for individual reasons differs for groups having different levels of education at a significance level of 10%. Tukey Test was performed to analyze the groups from which the difference obtained for the factor of individual reasons resulted. As a result of the test, it was found that the reason of the difference in question emerged between the nurses who were high school graduates and the nurses who had a master's degree. The nurses who have a higher level of education focus on education, career, etc. and create a significant difference on individual preference reasons.

create solutions to health problems from a global point of view. However, to do so, nurses should gain such qualifications by means of nursing education. It is seen that, in many countries, undergraduate, graduate and postgraduate curriculums are still not regulated so as to cover regional, national and global health.

Developments in the health system and in technology have introduced changes and innovations to nurses' work environment. In parallel with the developments in the health system and in technology, nurses have carried their work environments to global healthcare organizations. There are many reasons that drive nurses to work in global healthcare organizations. Such reasons were analyzed in our study and it was determined that the effective factors originated from individual, territorial and unemployment reasons. It was found that, among individual factors, the variable having the highest positive effect was age. Being younger than 30 has a significant effect on the preference of working at a hospital abroad. The older the nurses are the less they prefer to work abroad. The factors which motivate nurses to prefer a job abroad include being a university graduate, being a male, having at least one child, having a monthly income higher than 2000 TL, longer weekly working hours in our country. On the other hand, being less-experienced negatively affects the preference of working abroad. The less experienced they are the less they prefer to work abroad.

Even though the awareness in international nursing and global health raises day by day, it has not reached the desired level yet. Nursing teachers play a crucial role in making it reach the desired level. For enabling nurses to take part in the global health system and raising their awareness, nursing teachers have to re-regulate the curriculum. Besides, global health-related scientific conferences need to be organized. Due to the fact that the sources written in this field are scarce, it is necessary to increase the number of sources to shed light on the subject. Another activity to perform for developing international health services is to develop joint projects with international healthcare organizations or participate in the existing projects. Apart from all these, in order to develop international health services, local and foreign student-teacher exchange programs have to be held at global level.

5. REFERENCES

- Aiken, H.L., Buchan, J., Sochalski, J., Nichols, B. and Powell, M. (2004) 'Trends In International Nurse Migration', *Health Affairs*, 23(3): 69-77.
- Aiken, H.L. (2007) 'U.S. Nurse Labor Market Dynamics Are Key to Global Nurse Sufficiency', *Health Services Research*, 42(3p2): 1299-1320.
- Blouin, C. (2005) 'Nafta and the Mobility of Highly Skilled Workers: The Case of Canadian Nurses', *The Estey Centre Journal of International Law and Trade Policy*, 6(1): 11-22.
- Brush, L.B., Sochalski, J. and Berger, A.M. (2004) 'Imported Care: Recruiting Foreign Nurses To U.S. Health Care Facilities', *Health Affairs*, 23(3): 78-87.
- Brush, L.B. (2008) 'Global Nurse Migration Today', *Journal of Nursing Scholarship*, 40(1): 20-25.
- Gostin, O.L. (2008) 'The International Migration and Recruitment of Nurses: Human Rights and Global Justice', *JAMA*, 299(15): 1827-1829.
- Greene, W. H. (2002) *Econometric Analysis*, Prentice Hall: New Jersey.
- Haour, M. and Davies, A. (2008) *Return Migration of Nurses*, International Centre on Nurse Migration: USA.
- Ivkovic, M. (2011) 'International Nurse Migrations – Global Trends', *Journal of the Geographical Institute "Jovan Cvijić" SASA*, 61(2): 53-67.
- Kaya, H. (2010) 'Küresel Sağlık Geliştirmede Hemşirelik Eğitimi', *Uluslararası İnsan Bilimleri Dergisi*, 7(1): 360-365.
- Kingma, M. (2001) 'Nursing migration: global treasure hunt or disaster-in-the-making?', *Nursing Inquiry*, 8(4): 205-212.

- Kingma, M. (2007) 'Nurses on the Move: A Global Overview', *Health Services Research*, 42(3p2): 1281-1298.
- Simoens, S., Villeneuve, M. and Hurst, J. (2005) '*Tackling Nurse Shortages in OECD Countries*, OECD, France', [www document] <http://www.oecd.org/dataoecd/11/10/34571365.pdf> (accessed 13 August 2012).
- WHO (2010) 'International Migration of Health Workers', [www document] <http://www.oecd.org/migration/internationalmigrationpoliciesanddata/44783473.pdf> (accessed 10 August 2012).
- Wooldridge, J. (2002) *Introductory Econometrics: A Modern Approach*, South-Western College Publishing: USA.

The Effect of Exchange Rate Volatility and Trade Deficit of Pakistan-A Comparative Analysis

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Abstract:

The study aims at the investigation of the relationship between the volatility of exchange rate and imports, exports and trade deficit of Pakistan while making a comparison between three consecutive decades (1980 through 2010). This comparison is intended to account for the political influence of democratic and non-democratic regimes on exchange rate, imports, exports, and trade deficit. The data of the variables is collected from official websites of Pakistan Bureau of Statistics and State Bank of Pakistan over a period of 30 years. The first part of the study is descriptive comparative analysis which showed that in the last regime (2000-10) exchange rate volatility performed most consistently; exports, imports and trade deficit growth were highest. The second part of the study is to investigate the link between the volatility of exchange rate, imports, exports and further trade deficit. The results showed the exchange rate volatility

does have any significant impact on trade deficit. However, it has significant positive (contradictory to the previous studies) impact on imports and exports. Moreover, the duration for analysis can be extended.

Introduction:

Pakistan followed different exchange rate regimes; a fixed exchange rate before 1982, managed floating exchange rate since 1982 and flexible exchange rate system since July 2000. Due to controlled exchange rate a very small fluctuation was noted during the last regime. However, (Kumar and Dhawan, 1991) concluded that during the both regimes, fixed and managed floating rate regime, the share of Pakistani exports remained fairly stable. In fact Pakistan's position as measured in the form its contribution to world exports remained flat over the previous 24 years. It ranged from 0.12 percent to .18 percent, the first figure is minimum and belongs to 1980 and second figure is a maximum and belongs to 1992. Later on, the share of Pakistani exports was .17 percent during 2002-2003. It was due to floating exchange rate which caused the exchange rate volatility. The sole research was conducted by (Kumar and Dhawan, 1991) in the context of Pakistan who observed the relationship between the volatility of exchange rate and exports in the context of developed world which covered a period of 1974-1985. The findings of the study are as following; the exchange rate volatility significantly impacts the demand in exports, Japan and West Germany were suggested as an alternate market for the Pakistani exports instead of USA and UK.

In Pakistan, there has been adverse volatility in exchange rates over the decades, this primarily derived attention towards this phenomenon equally for policy makers as well as researchers. Both, the nature as extent, dimensions of this volatility have lead them to investigate the impact further on the trade volume of Pakistan so that appropriate policy measure can be taken. The greater volatility in exchange rate has resulted in declining trend in trade in many countries which ultimately added to the further uncertainty about the prospect profitability from the exports of the country. This uncertainty may ask for hedging in the short run and may also effect the investments decisions of the firms in long run. However, the results of long run volatility have varied greatly. Although we see a large body of literature available on the topic, but the picture in the context of Pakistan looks dismal. We have tried to look at the phenomenon from a political perspective making it a regime-wise comparison.

Literature Review:

While we go through the literature on the topic, the studies yield mixed result. The research done by (Hooper and Kohlhagen, 1978) is considered to be pioneer in this arena. However, they did not found any significant effect of the volatility of exchange rate on trade volume. The study covered both bilateral and multilateral trade among developed countries over a period 1965–75.

(Cushman, 1983) had focused on the relationship between volatility in real exchange rate and trade volume; and found the negative relationship between them. He also conducted another study by considering a third country into the framework. The results of the study showed that the volatility in exchange rate effects on bilateral trade flows which further explored dependence on two other factors i.e. , the exchange rate risk and exchange rate fluctuations.

(Akhtar and Hilton, 1984) studied the volatility in exchange rate and used standard deviation in order to analyse the data. He found that the volatility in exchange rate had negative impact on the

imports and exports of bilateral trade between West Germany and United States. This impact was found highly significant.

(Gotur,1985) examined the exchange rate risk for more than two countries by increasing the sample size in his study. Not like as (Akhtar and Hilton,1984), this study revealed that there is no significant relationship exchange rate risk and trade volume. The results of the study were same as found in the report published by IMF in 1984.

(Chowdhury ,1993) conducted a study to find out the impact of exchange rate volatility on the flows of trade. The study focused on the G-7 countries. The results showed a significant negative relationship between of the exchange rate volatility and trade volume over the sample.

(Baak,Mahmood, and Vixathap, 2002) also conducted the similar study in East Asian countries. The countries included Hong Kong, South Korea, Singapore and Thailand. The focus of the study was both over short run and long run. They also found a negative relationship between the volatility of exchange rate and exports. It is also worth mentioning here that several studies have been conducted to explore the relationship between the volatility of exchange rate and the growth of exports. But the results of such studies did not produce any conclusion. However, these studies produced links between exchange rate policies and the level of growth.

Some more studies conducted on the topic were; (Bahmani-Oskooee; 1984, 1986; Coes,1981; Rana,1983). (Bahmani-Oskooee,1984,1986). These studies included developing countries and also included the pegged exchange rate regimes. The results of these studies concluded that the exchange rate has a significant impact on trade flows. (Coes,1981;Rana 1983) studied the topic depending upon another study conducted by (Hooper-Kohlhagen,1978). Coes studied Brazilian exports and included 22 sectors over a period of 1966-1974. The study concluded that over the pegged exchange rate regime, the Brazilian economy observed a significant decrement in the exchange rate volatility. This decrement lead to price changes which resulted in openness in economy after 1968.

As observed, (Rana,1983) studied the developing countries and his study is considered to be the most comprehensive per se. he also derived similar results as the study of (Bahmani-Oskooee,1984). He also established the demand function for all the countries, and inferred insignificant and negative relationship between the volatility of exchange rate and the volume of imports.

Another research conducted by (Alam-Qazi,2010) studied the depreciation of the local currency and the effective exchange rate volatility in a real sense. The study found them to be unrelated to import demand. The study was conducted in the context of Pakistan and the results can be generalized over the long run too. However, the short run perspective of the study explored the dynamic tends to of the variable like real economic growth, relative price of imports,real effective exchange rate and real effective exchange rate volatility Granger. The study concluded that the variable discussed effect the demand of imports over the short run.

Exchange rate policy has assumed an added importance in recent years due to changing global economic conditions. Another study examined the foreign exchange reserves, real and effective exchange rate response of imports demand in Pakistan using both classical and time series econometrics approaches. The real depreciation of the exchange rate has been found to have dampening impact on import demand. Adoption of a realistic exchange rate is highly desirable.

Domestic inflation and an unrealistic exchange rate may discourage the investment flows needed to the new incentives. A stable and long-run relationship exists between imports and GDP, effective exchange rate and relative import prices. Co integration results do not support the long-run equilibrium situation between imports; and foreign exchange reserves and real exchange rate (Muhammad Afzal, 2007).

Finally, the study conducted by (S.Alam, Q.M. Ahmad, 2011) aimed at exploring the impact of exchange rate volatility on trade deficit of Pakistan. The study also discusses some important variables of bilateral imports of Pakistan with its major trading partners like USA, UK, Japan, Saudi Arabia, UAE, Germany and Kuwait. It covered a period of 1982Q1 to 2008Q2. The study concluded income elasticity to be significant with differing magnitude. It was also concluded that the volatility in exchange rate has negative and statistically significant for Pakistan's bilateral import from UK in the long run.

Objectives of the study:

As the literature review suggests, previous study are provide mixed result on how exchange rate volatility impacts imports , exports and trade deficits. However, most of the studies showed that exchange rate volatility negatively affects imports, exports and trade volume. The purpose of the study is two-fold, descriptive and analytical. Firstly, we make a comparison between three decades, 1980-90, 1990-00, 2000-10. Out of the three decades being analyzed are two are non-democratic and a democratic. The variables intended for comparison are exchange rate volatility, imports, exports, and trade deficit. Our study is different from the previous ones in that we exclude trade volume and include trade deficit instead.

Secondly, the second objective is to explore the impact of the volatility of exchange rate on imports, exports and trade deficit. For the purpose, we develop three different models. We prospect a negative impact of the volatility of exchange rate on imports and exports as suggested by the literature.

Data and Methodology:

As discussed earlier our purpose of the study has been For the purpose of performing the analysis, data related to exchange rate, imports, exports, and trade deficit has been collected from tow websites; State Bank of Pakistan(SBP) and Pakistan Bureau of Statistics(PBS). We have collected data for 30 years. Analysis was performed over a period of 30 years and the period was further subdivided into three decades; 1980-90, 1990-00, 2000-10. The analysis was conducted in phases i.e. descriptive and analytical. The analyses are performed by using SPSS 16.

In order to obtain the second objective of the study, we have applied three different ordinary least square models. The models which serve our purpose are given as below:

$$TD = \alpha_1 + \beta_1 EV + \epsilon_1 \dots\dots\dots(a)$$

$$Imp = \alpha_2 + \beta_2 EV + \epsilon_2 \dots\dots\dots(b)$$

$$Exp = \alpha_3 + \beta_3 EV + \epsilon_3 \dots\dots\dots(c)$$

Where, in models, TD (trade deficit), Imp (imports), Exp (exports) are dependent variables and EV which represents exchange rate volatility as independent variable. The above models possess all the assumptions of classical linear regression models (CLRM). The parameters of the above models are estimated by using Ordinary Least Square technique.

Descriptive Analysis:

Table 1 depicts the main descriptive features of the data for three decades respectively; 1981-90, 1990-00 and 2000-10, each of them is described as below:

First Decade (1980-90):

This era was first of two non-democratic eras included in our analysis. Zia-ul-Haq was leading the country during the decade. Prior to 1982 the exchange rate was used to be fixed. But Pakistan adapted to managed floating exchange rate since 1982 through 2000. During the first decade the average annual exchange rate has fluctuated between Rs10.65 per dollar to Rs 22.53 per dollar with a mean and standard deviation of Rs16.65 per dollar and Rs 3.60 per dollar respectively. This shows an increase of 111.54 percent during the decade. Furthermore, coefficient of variation is 0.22 which further helps us in making a decade wise comparison.

The volatility of exchange rate which is scaled standard deviation of exchange rate plummeted between Rs 0.14 per dollar and Rs 1 per dollar with a mean and standard deviation of Rs 0.49 per dollar and Rs 0.32 per dollar respectively. The coefficient of variation was Rs 0.65 per dollar during the decade.

The exports and imports fluctuated between \$2,489.20-\$4,964.70 and \$5,363.60-\$7069.40 respectively. Exports increased by almost 100 percent whereas imports increased by 31.8 percent. Exports and imports had means and standard deviation of (\$3,430.62, \$5,943.77) and (\$901.12, \$605.11) respectively. Coefficient of variation for exports was 0.26 and that of imports was 0.10.

Trade deficit moved between \$-3,381.30-\$-1,603.30 during the decade with a mean of \$-2,471.28 and standard deviation of \$534.83. The coefficient of variation was -0.22.

Second Decade (1990-00):

This the only democratic era included in our analysis. It can jointly be tagged as Nawaz-Beanazir era. This era also followed managed floating exchange rate system. During the first decade the average annual exchange rate has fluctuated between Rs24.87 per dollar to Rs59.08 per dollar with a mean and standard deviation of Rs38.65 per dollar and Rs10.89 per dollar respectively. This shows an increase of 137.55 percent during the decade. Furthermore, coefficient of variation was 0.28 which further helps us in making a decade wise comparison.

The exchange rate volatility as measured by standard deviation of exchange rate plummeted between Rs0.13 per dollar and Rs 3 per dollar with a mean and standard deviation of Rs 1.16 per

dollar and Rs 0.95 per dollar respectively. The coefficient of variation was Rs 0.62 per dollar during the decade.

The exports and imports fluctuated between \$6,167.00-\$8,707.10 and \$7,631.20-\$11,894.20 respectively. Exports increased by almost 41.18 percent whereas imports increased by 55.86 percent. Exports and imports had means and standard deviations of (\$7,685.15, \$9,936.19) and (\$879.93, \$1,250.29) respectively. Coefficient of variation for exports was 0.11 and that of imports was 0.13.

Trade deficit moved between -\$3,522.10-\$-1,415.70 during the decade with a mean of \$-2,206.76 and standard deviation of \$ 7,35.31. The coefficient of variation was -0.33.

Third Decade (2000-10):

This was the most interesting and second non-democratic era in our analysis. The exchange rate was pegged during this era. This period can be named as Musharraf era. During the decade the average annual exchange rate has fluctuated between Rs57.59 per dollar to Rs85.61 per dollar with a mean and standard deviation of Rs66.84 per dollar and Rs10.67 per dollar respectively. This shows an increase of 48.65 percent during the decade. Furthermore, coefficient of variation was 0.16 which further helps us in making a decade wise comparison.

The exchange rate volatility as measured by standard deviation of exchange rate plummeted between Rs0.16 per dollar and Rs2.69 per dollar with a mean and standard deviation of Rs0.98 per dollar and Rs0.89 per dollar respectively. The coefficient of variation was Rs0.90 per dollar during the decade.

The exports and imports fluctuated between \$9,134.60-\$19,290.00 and \$10,339.50-\$39,965.50 respectively. Exports increased by almost 111.17 percent whereas imports increased by 286.53 percent. Exports and imports had means and standard deviations of (\$14,565.85, \$23,809.68) and (\$3,695.06, \$10,648.35) respectively. Coefficient of variation for exports was 0.25 and that of imports was 0.45.

Trade deficit moved between -\$20,196.70-\$-1,415.70 during the decade with a mean of \$-9,036.57 and standard deviation of \$6,939.42. The coefficient of variation was -0.77.

The descriptive analysis shows the exchange rate has been very relatively stable during the last decade (2000-10) due to pegged exchange rate system. During the last decade, the increase in exchange rate was the lowest of the all decade whereas democratic decade had the highest increase in exchange rate. The part of reason may be the underlying political factor. The lowest coefficient of variation also depicts the same thing. The same phenomenon has been explained by **Graph-1**. Although the average annual exchange rate seems to be very high but the when coupled with the mean of volatility of exchange rate yields the same results as discussed earlier.

While we analyze the exports and imports through the decades, we see that increase in average exports and imports were the highest during the last decade (2000-10). The reason for this increase seems to be moderate investment and trade policies during the Musharraf Regime and pegging of the exchange also played its role. **Graph-2** enlightens the facts. **Graph-3** explains the trade deficit which was highest during the last decade (2000-10) mainly due to rise in imports during the era.

Results:

The estimated forms of the models (a), (b) and (c) are given below with their explanations:

$$TD = -3,201.65 + (-1,558.69)EV \dots\dots\dots(1)$$

Equation-1 shows that whenever the exchange rate volatility is zero then trade deficit will be \$ - 3,201.65 and if we change exchange rate volatility with the rate of Rs1 per dollar then the trade deficit will decrease by 1,558.69 dollars. As the t-stat is -1.368(p-value 0.18) which is insignificant and the value of R-square, which shows the explanatory power of the model, is 0.39 low hence the overall model is insignificant. Thus, it results in rejection of the hypothesis as exchange rate volatility plays no significant in determining trade deficit.

$$Imp = 6,855.23 + 1,940.35EV \dots\dots\dots(2)$$

Equation-2 shows that whenever the exchange rate volatility is zero then imports will be \$ 6,855.23 and if we change exchange rate volatility with the rate of Rs1 per dollar then the imports will increase by 1,940.35 dollars. As the t-stat is 11.74(p-value 0.00) which is significant and the value of R-square, which shows the explanatory power of the model, is 0.81 high hence the overall model is significant. Thus, it results in the acceptance of the hypothesis as exchange rate volatility plays significant positive in determining exports.

$$Exp = 10,103.21 + 3,557.6EV \dots\dots\dots(3)$$

Equation-3 shows that whenever the exchange rate volatility is zero then exports will be \$ 10,103.21 and if we change exchange rate volatility with the rate of Rs1 per dollar then the exports will increase by 3,557.6 dollars.

As the t-stat is 9.65(p-value 0.03) which is significant and the value of R-square, which shows the explanatory power of the model, is 0.77 high hence the overall model is significant. Thus, it results in the acceptance of the hypothesis as exchange rate volatility plays significant positive in determining imports.

Conclusion:

The study was an addition to the previous studies conducted on the topic in terms of a comparison between democratic and non-democratic regimes over last 30 years. The first part of the study was the comparison between three decades (1982-90, 1990-00, 2000-10). Our descriptive analysis showed that the last decade (2000-10) as consistent with respect to exchange rate volatility and also produced highest increase in exports and imports where the trade deficit was the maximum during the decade. The second part of study was to find out the relationship between exchange rate volatility and trade deficit, imports, and exports. Out the three models developed, the one including exchange rate volatility and trade deficit was insignificant. Our study was different from the previous studies in that it included trade deficit rather than the trade volume and the study made a comparison between democratic and non-democratic regimes.

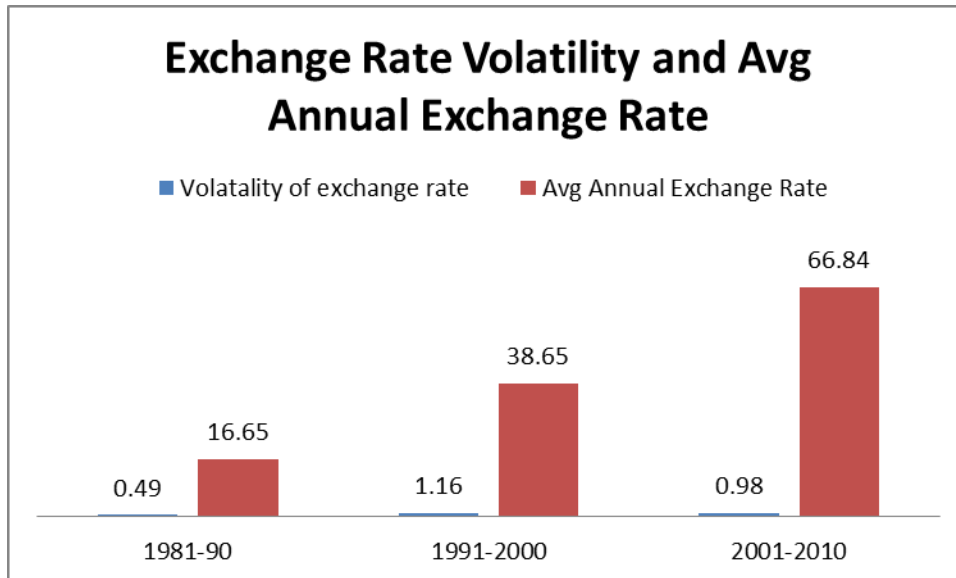
Although the study is very valuable in its own way, it still has some limitations. Firstly, the duration of data variables can be extended. Secondly, imports, exports and trade deficit data was available on an annual basis, it would have been better if we had monthly data.

Table-I

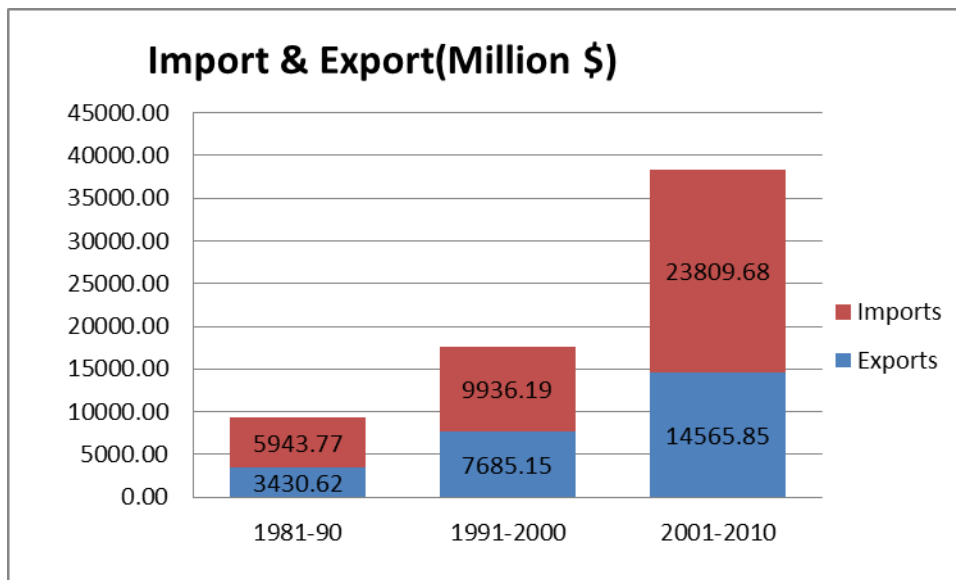
Decade	Descriptive	Volatility of Exchange Rate	Avg Annual Exchange Rate	Exports	Imports	Trade Deficit
1981-90	Min	0.14	10.65	2489.20	5363.60	-3381.30
	Max	1.00	22.53	4964.70	7069.40	-1603.30
	Mean	0.49	16.65	3430.62	5943.77	-2471.28
	S.D	0.32	3.60	901.12	605.11	534.83
	C.V	0.65	0.22	0.26	0.10	-0.22
1991-00	Min	0.13	24.87	6167.00	7631.20	-3522.10
	Max	3.00	59.08	8707.10	11894.20	-1415.70
	Mean	1.16	38.65	7685.15	9936.19	-2206.76
	S.D	0.95	10.89	879.93	1250.29	735.31
	C.V	0.82	0.28	0.11	0.13	-0.33
2001-10	Min	0.16	57.59	9134.60	10339.50	- 20196.70
	Max	2.69	85.61	19290.00	39965.50	-1015.50
	Mean	0.98	66.84	14565.85	23809.68	-9036.57
	S.D	0.89	10.67	3695.06	10648.35	6939.42
	C.V	0.90	0.16	0.25	0.45	-0.77

Graphical Explanation:

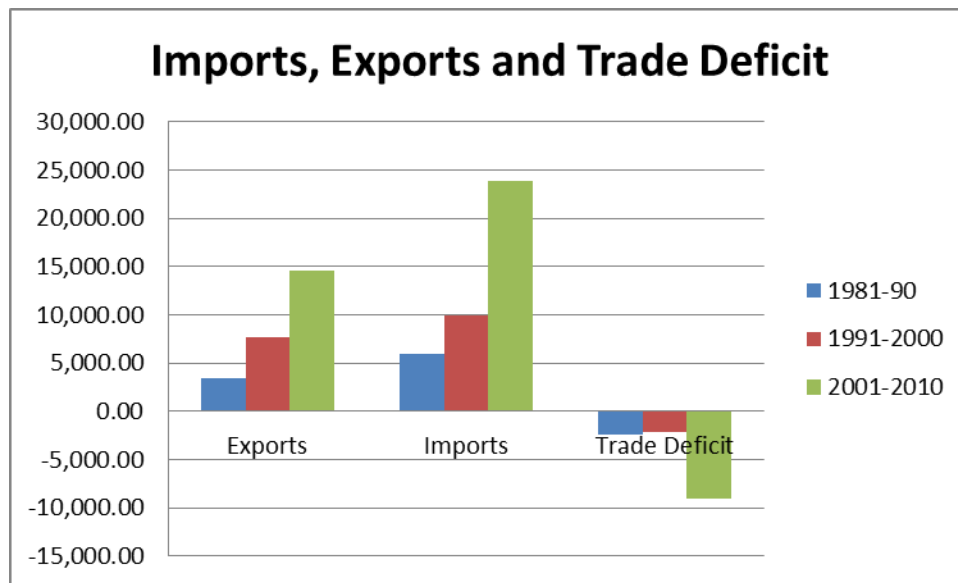
Graph-I



Graph-II



Graph-III

**Table-II**

Model	Intercepts	Slopes	t-stats	R-Squares
Model 1	-3,201.65 (1,371.93)	-1,558.69 (1,138)	-1.368 (0.18)	0.39
Model 2	6,855.23 (1,341.40)	1,940.35 (1,113.38)	11.74 (0.00)	0.81
Model 3	10,103.21 (2,598.66)	3,557.6 (2,156.93)	9.65 (0.03)	0.77

References:

1. Akhtar, M., and R. S. Hilton (1984) Effects of Exchange Rate Uncertainty on German and U.S. Trade. *Federal Reserve Bank of New York Quarterly Review* 9, 7–16.
2. Baak, S., A. Al-Mahmood, and S. Vixathap (2002) Exchange Rate Volatility and Exports from East Asian Countries to Japan and U.S. University of Japan. (Manuscript).
3. Bahmani-Oskooee, M. (1984) On the Effects of Effective Exchange Rates on Trade Flows. *Indian Journal of Economics* 256, 57–67
4. Chowdhury, A. R. (1993) Does Exchange Rate Volatility Depress Trade Flows? Evidence from Error-Correction Models. *The Review of Economics and Statistics* 75, 700–706.
5. Coes, D. (1981) The Crawling Peg and Exchange Rate Uncertainty. In J. Williamson (ed.). New York: SDT. Martin's Press, 113–136.
6. Cushman, D. O. (1983) The Effects of Real Exchange Rate Risk on International Trade. *Journal of International Economics* 15, 45–63
7. Cushman, D. O. (1986) Has Exchange Risk Depressed International Trade? The Impact of Third Country Exchange Risk. *Journal of International Money and Finance* 5, 361–379.
8. Gotur, P. (1985) Effects of Exchange Rate Volatility on Trade: Some Further Evidence. *IMF Staff Papers* 32, 475–512.
9. Hooper, P., and S. W. Kohlhagen (1978) The Effects of Exchange Rate Uncertainty on the Price and Volume of International Trade. *Journal of International Economics* 8, 483–511.

10. Rana, P. (1983) *The Impact of Generalised Floating on Trade Flows and Reserve Needs: Selected Asian Developing Countries*. New York: Garland Publishers.
11. S. Alam and Q. M. Ahmed(2010)Exchange Rate Volatility and Pakistan's Import Demand: An Application of Autoregressive Distributed Lag Model. *International Research Journal of Finance and Economics* 48, 7-22.
12. Mohammad Afzal(2007) EXCHANGE RATE RESPONSE OF IMPORT DEMAND IN PAKISTAN. *Sarhad J. Agric.* 23, 1181-1186
13. S.Alam and Q.M. Ahmad(2011)Exchange Rate Volatility and Pakistan's Bilateral Imports from Major Sources: An Application of ARDL Approach. *International Journal of Economics and Finance* 3, 245-254.

Financial Derivatives and the U.S. Residential Real Estate Market

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“As long as loan contracts are expressed in conventional nominal terms, a high and variable rate of inflation—or more precisely a significant degree of uncertainty about the future of the price level — can play havoc with financial markets and interfere seriously with the efficient allocation of the flow of saving and the stock of capital.” Modigliani 1974

Abstract

Residential real estate market is one of the largest asset classes, but is incomplete as it does not possess a well-developed and efficient derivatives market. This study presents an overview and complexities of the residential real estate market in the United States, and why developing a derivatives market is vital to future transparency, efficiency and safety of its participants. Traditionally regarded as a safe investment, this report demonstrates that the current American residential market is inherently dangerous and will continue to be volatile, unpredictable, and prone to future crises by showing the complexities of determining the intrinsic values of the local housing markets and the consequences when price inefficiencies arise with the potential to build momentum and develop into bubbles. A well-developed derivatives market may provide benefits to reduce volatility in spot prices, and provide a mechanism for price discovery. This paper concludes by considering these benefits of derivative markets, and shows that these benefits could actually be successfully applied to the residential real estate market.

Introduction

The real estate property market is by far the largest market in developed economies, representing 30 to 40 percent of all underlying physical capital (Fabozzi, Shiller, & Tunaru, 2010). At the height of the housing boom in 2005, residential property alone accounted for \$21.6 trillion, as compared to \$17.0 trillion in equities and \$25.3 trillion in fixed income (Economist, Apr. 20, 2006). Residential real estate is characterized as a combination of a consumption asset and a source of high leverage, the characteristics that often fluctuate and disrupt the financial stability of households (Shiller & Weiss, 1999). However, unlike equities, bonds, and other sizable investment, the residential property market in America may be incomplete without circuit breakers and an active derivatives market. These omissions may continue to cause future problems for homeowners, financial institutions, policy makers, American taxpayers and the economy.

After the recent financial crisis, a third of all homes with mortgages in the United States have debt exceeding the value of their home with half of these experiencing loan-to-value ratio in excess of 130% (Feldstein, 2009). From their peak, the national home prices have fallen 34% (Observatory, 2012), and some analysts predict another 20% fall in the coming years (Shilling, 2010). As a result, most lenders, investors and individuals are uncertain about future economic conditions further depressing future economic growth and real estate prices.

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Regulations in some cases have proved inadequate. For example, Fannie Mae and Freddie Mac were created to provide stability and liquidity in the housing markets, however, from 2001 to 2007, mortgage debt in the US almost doubled (Economist, Jul. 9, 2009). By the end of 2009 were collectively sitting on hundreds of billions of dollars in loans and trillions of dollars of mortgage-backed securities (MBS) guarantees (Woodwell, 2009). Such large numbers of mortgage defaults and foreclosures will undoubtedly hamper American and global economic recovery.

The recent US housing collapse and the subsequent financial crises demonstrate the devastating potential of large-scale house price volatility. Despite that, homeowners still do not have an effective way of protecting their home equity and mortgages against future price and interest rate fluctuations. At the same time, the standard plain vanilla mortgages being offered to new homeowners are too rigid in their current form, reducing liquidity and efficiency of the current residential market. Contrary to earlier predictions (Salmon, 2010), a recent survey showed that in 2012, 81 percent of respondents still believed in the American Dream of owning a house, regardless of financial risk (Economist, Aug. 4, 2012). If the current real estate and mortgage market continues to perform as it has in the past, future property bubbles will undoubtedly occur, and will cause more financial distress to homeowners, financial institutions, and the economy (Economist, Mar. 3, 2011). Changes to the current mortgage terms and implementation of new hedging strategies must be developed.

This report presents an overview and complexities of the residential real estate market in the United States and why developing a derivatives market is necessary component for future transparency, efficiency and safety of its participants. Traditionally regarded as a safe investment, this report demonstrates that the current US residential market is inherently dangerous and will continue to be volatile, unpredictable and prone to future crises. The report outlines the complexities of determining the intrinsic values of the local housing markets and the consequences when price inefficiencies arise and subsequently build momentum. At the same time, finance theory presumes that a well-developed derivatives market is a valuable component for investment markets as it reduces volatility in spot prices, provides an efficient mechanism for price discovery and it is a cost-effective way to execute different hedging strategies. This paper concludes by examining these presumed benefits of derivative markets to ascertain if they could actually be successfully applied to the residential real estate market.

Inherently Dangerous

One of the biggest fallacies inherent in today's society is that buying property and land are safe investments (Shiller R. , 2007). This fallacy is propagated by the belief that there is a finite amount of land available and as population continues to increase, so will the demand and values of all properties. Such a basic economic argument is easily understood by most individual homebuyers; however, it does not capture the complexities that are inherent in property markets.

Property cannot easily be compared to other securities, such as stocks and bonds, as it is both a consumption and investment asset. As prices increase, the demand for property often increases and speculators see this as an opportunity to buy. At the same time, real estate involves a high degree of leverage. Many new property owners may take out mortgages up to 95% of the asset value which is far greater than the 50% required for most securities bought on a margin. And unlike other securities, it is not efficiently priced. Most house values are derived from the latest transaction in the same geographic region and people are more likely to pay an inflated price for a property than, for example, a new bond issue. Furthermore, due to the large transaction costs and long lead times, residential properties cannot easily be

sold short, which hampers the ability to control further price increases. As prices begin to rise, the momentum can build up quickly and perpetuate further speculation (Shiller R. , 2008).

Lenders of mortgages, on the other hand, use collateralization as a way of protecting against individual mortgage defaults and interest rate changes. Such collateralization increases the balance sheets of lenders during economic expansions, which in turn promotes more mortgage lending and further price increases. Conversely, the high degree of leverage of most mortgage lenders means that as economy reverses, they impose tighter loan standards, which cause cash crunches, reduction of home sales and decrease in house prices. The high degree of leverage, collateralization and the sheer size of the US and global property market means that it will continue to exhibit volatile swings in tandem with economic conditions and fiscal policy decisions (Economist, Mar. 3, 2011).

The transaction costs of an efficient and liquid derivatives market is only a fraction of the underlying security. As a result, instead of simply abstaining from the real estate market if they believe it to be overpriced, more hedgers and speculators will be willing to enter the market and take a position against future price increases. Increase in participation will improve price discovery, because it would be unlikely for some individuals or enterprises to distort property prices with eccentric positions, which in turn will reduce the volatility of residential house prices.

How to Price a House and Behavior of Housing Markets

The variables that caused house prices to change dramatically from one region to another were not very well researched until after the US housing bubble eradicated trillions of dollars from the global economy. Prior economists focused on broader economic conditions, such as demographics, employment and income growths, which do not capture the differences inherent in different geographic locations (Case & Shiller, 1990). House markets are local, and therefore reflect local conditions (Hwang & Quigley, 2006), which could explain why Canada's housing market did not collapse, even though Canada went through an economic and employment downturn at the same time as the United States. Canadian mortgage regulations is stricter than American: fixed rates lasting for a maximum of 5 years, a 75% maximum on loan-to-equity value for uninsured mortgages (90% maximum for insured mortgages), and most mortgages being held in portfolios of banks and credit unions (the same enterprises that issue the mortgages) (Green & Wachter, 2005). As a result, Canadian house prices dipped only slightly and continued to increase at a similar rate than before the crisis (Appendix A).

As property is both a consumption and an investment asset, fundamental attributes must be independently applied to specific geographic locations coupled with the emerging field of behaviour finance to estimate the intrinsic values of individual houses (Shiller R. , 2007). The broad economic fundamental factors that have been shown to affect house prices are: changes in financing patterns and interest rates, construction costs, age of the housing stock, housing starts, industrial organization of the housing market, income and employment growth, and changes in demographics. Other broad fundamentals look at the ratios and composition of national debt, such as mortgage and loan debts as a percentage of GDP, and rental or mortgage payments as a percentage of personal income (Case & Shiller, 2004). Glick and Lansing (2010), for example found that countries that experienced the highest increase in debt relative to income, also had the most pronounced increases in house prices.

Fundamental factors make it difficult to predict future price changes of the overall housing market in US, because most factors rely on the assumptions of the individuals making the forecasting model and many fundamental factors do not fit well on the local level. Factors such as schools, accessibility, infrastructure, crime levels, and general atmosphere can vary significantly within each individual city, let alone on the state or national level (Case & Shiller, 2004). As a result, researchers

began to focus on the behavior of the participants in the housing market in order to understand house price trends.

Most real estate indexes that display price trends rely on the most recent sales activities to gauge existing price levels. Such techniques do not demonstrate the underlying factors that caused the sale of a particular home, as one ridiculously high bid raises the values of all surrounding houses, even though the motivation behind the high price may have nothing to do with the intrinsic value of the property. Greg Davies of Barclays Wealth, compares buying a home to buying art, as it is an emotional decision and raises the chances that people will pay over the odds for it (Economist, Mar. 3, 2011), and as people see increases in the surrounding house prices, the upward price momentum will accelerate. Price changes in one year, tend to continue in the same direction for many years to come (Case & Shiller, 1990). These results were explained by Benítez-Silva, Eren, Heiland, & Jiménez-Martín (2008) and Shiller (2003) and showed that when people bought houses during boom markets, they tended to overstate their expected house appreciation, in the region of 12 - 16 percent per year. On the other side, people that bought their houses during economic downturns tended to be more realistic about their future house values.

Such a discrepancy between house values and market behavior demonstrates that the real estate market is not efficient. Broad fundamental data can show the general trend of the house prices in a particular market, however, they are not very efficient in distinguishing between overpriced or underpriced houses, nor predicting the enormously devastating house bubbles. The better approach would be to combine macro and micro-level historical data with current fundamentals to determine the direction of the market, its future potential and the likelihood of participants overestimating the values of their properties. Then employ location specific parameters on a risk-adjusted basis over different sets of scenarios (Fabozzi, Shiller, & Tunaru, 2010).

These technical valuation methods are prohibitive for most homeowners who tend to rely on the media and neighbors to gauge local house markets. On the other hand, professional investors participating in real estate derivatives markets, if such a market existed, can utilize such methods, because they would need to rely on efficient and accurate valuation models in order to exploit discrepancies between the market values of properties and their intrinsic values. With time, these investors will continue to improve the efficiency and accuracy of valuation models, which in turn will benefit individual homeowners, because spot prices will become less volatile and future spot prices will be better forecasted.

Housing Bubbles

Housing bubbles are characterized by an increase in real prices of houses to unsustainable levels, and then followed by their even more rapid collapse. Spotting bubbles is a difficult task, because many of the property price surges could be explained using fundamentals, such as economic conditions and demographics, and housing bubbles unlike other speculative bubbles can continue to grow for years, usually abated by the subsequent fiscal policies. No one doubts now, that a housing bubble caused the most recent collapse of the U.S. real estate market and subsequently the economy. However, a few years before the collapse, Allan Greenspan, the Chairman of Federal Reserve (2004), first denied that a bubble existed:

Housing price bubbles presuppose an ability of market participants to trade properties as they speculate about the future. But upon sale of a house, homeowners must move and live elsewhere. *This necessity, as well as large transaction costs, are significant impediments to speculative trading and an important restraint on the development of price bubbles.*

then admitted that the real estate markets in some area were a little frothy, but stopped short of calling it a national housing bubble (Leonhardt, 2005).

No two bubbles are alike, but most are formed through a shift in one or more fundamentals, such as demographics, interest rates, or economic expansions (Economist, Mar. 3, 2011). Such shifts increase demand for property, which causes prices to increase, as the short-term property supply is limited. While supply is limited prices spike and the price momentum begins to accelerate. Shiller (2007) argues that factors that cause the boom in prices is through the widespread perception that houses are great investments and their value would always increase: a perception that is exacerbated by real estate brokers, the media and actually seeing surrounding houses being sold at record prices. As the bubble is formed, even the most risk-averse investors believe that the house that they would normally be out of their budget now looks reasonably priced, because they will be compensated later as the house price appreciates in the future. At the same time, national savings rate decreases, because they believe the appreciating value of their house will do the savings for them (Case & Shiller, 2004). Shiller (2007) identified precipitating factors that changed homebuyers' opinion about market conditions that have an impact on demand, which are amplified by the price-to-price feedback loop.

The fallacy of thinking that buying property is a great investment and that home prices will always increase is not limited to individual homebuyers; large financial institutions follow similar principles when conducting their lending and borrowing decisions. For financial institutions, property is a great investment because it requires relatively small capital costs and property looks attractive on their balance sheets. As home prices begin to increase, so do the values of the assets held by the banks. As asset values begin to increase, they increase their leverage and increase their mortgage and lending activities. Competition between banks and mortgage providers cause them to lower their minimum standards and lend even more mortgages to individuals that would normally not qualify, better known as sub-prime mortgages. The rational, and there is always one, is that if these new risky mortgages default, the bank will be able to foreclose the property and then quickly sell it at an even higher price very quickly (Economist, Jul. 9, 2009). This inaccurate perception became very apparent in 2006, as interest rates increased and the banks were flooded with millions of delinquent mortgages and foreclosed houses they could not then resell.

As outlined earlier, identifying forming bubbles is a difficult task, because most price increases and their sustainability could be explained with fundamental factors. During the mid-2000s, as much as 40 percent of residential property sales were either vacation homes or purely speculative purchases (Jurgilas & Lansing, 2012). Without a developed derivatives market, such speculation is impossible to control in American residential real estate markets. Aside from abstaining from the property market altogether, large transaction costs and long lead times, make it risky for even the most seasoned investors to enter the property market and exploit the perceived discrepancies. The ability to exploit inefficiencies, with the use of much cheaper derivatives, prevent local froths from developing into large scale bubbles, and bursting unexpectedly as a result of external factors, such as an increase in interest rates or unemployment.

History of Residential Mortgages in the United States

The United States' current mortgage market and its securitization is the most developed in the world, but even it, had its humble beginnings somewhere. The mortgages issued at the turn of the century had large down payments, variable interest rates and much shorter maturities, as many homeowners renegotiated their mortgages every year. A typical household mortgage would have a variable interest rate and maturity of no more than 10 years, with a balloon payment at the end of the term (Cho, 2004). The balloon payment was due immediately at maturity unless the borrower could refinance the loan.

The problem of continual refinancing on the real estate market became apparent during the Great Depression. As the credit crunch loomed, many homeowners became unable to refinance their loans and lost their houses, which subsequently collapsed the housing market, further exacerbating economic conditions in the country. To help alleviate the problems with the housing market, the government created: the Home Owner's Loan Corporation (HOLC), the Federal Housing Administration (FHA) and later the Federal National Mortgage Association (Fannie Mae). These three institutions played a pivotal role in shaping the current US mortgage market (Green & Wachter, 2005). The HOLC used the sale of federal bonds to purchase defaulted mortgages and then reinstating them at more favorable terms, such as fixed rate fully amortized mortgages with 20-year maturities. The FHA was charged with providing insurance and guarantees of mortgages. To this day charge a premium on new mortgages that meet its standard requirements.

In 1938, the Federal National Mortgage Association was created with a directive of abetting in secondary markets for US mortgages. Similar to HOLC, Fannie Mae issued bonds for FHA qualified mortgages in order to restore and keep trust in the real estate market. After World War Two, the FHA sought to spur housing construction and the national residential markets by substantially liberalizing their terms. For example, maximum maturities were increased to 30 years, the loan-to-value ratio to 95% and very low interest rates to all returning veterans (Green & Wachter, 2005). Commercial banks were the primary sources of mortgages at the time, as their deposits were guaranteed by the government and, therefore, were able to offer low rates of slightly higher than the Treasury bills.

Over the next few decades, the relative stability of the mortgage markets were disrupted as interest rate volatility increased, resulting in shortages of funds available to mortgage borrowers relying on fixed rates. As a result, the government split Fannie Mae into two entities: the Government National Mortgage Association (Ginnie Mae), which would use government bonds to buy FHA qualified mortgages and Fannie Mae, which became private and would now be able to buy and sell mortgages not backed by the government in order to raise additional funds for existing mortgages. In addition, Freddie Mac was created to securitize mortgages of the savings and loans. These institutions were charged with promoting liquidity, creation of secondary markets and provision of credit for residential mortgages (Diamond, 2004). Over the next few decades these institutions worked towards standardizing real-estate mortgages across financial institutions and the country. For example, a depositor issuing residential fixed rate mortgages would typically sell them to either Ginnie Mae, Fannie Mae or Freddie Mac, who in turn would pack these loans into mortgage backed securities (MBS) and sell them to institutions capable of holding long-term fixed rate assets. Such securitization became a dominant source of funds for residential mortgages in America (Green & Wachter, 2005).

The savings and loans (S&L, thrift) crisis in the mid 1980's demonstrated the challenges of holding long-term assets at fixed interest rates. The proliferation of fixed rate mortgages in the decades following WW II, was only possible with low and stable nominal rates. A lesson apparently not learned in the build up to the 2008 financial crisis, as Fannie Mae and Freddie Mac were holding almost 45% of all mortgages in the US, most denominated with fixed interest rates (Thomas & Van Order, 2011).

The Problem with Current Mortgage Products

Thygeson (1978) argued that the biggest challenges in making mortgage markets more efficient were lack of homogeneity in mortgage contracts and lending at fixed rates over long-term horizons. Over the subsequent decades, the FHA and other government agencies managed to standardize and even securitize mortgage contracts in the US. However, the residential mortgage markets and forward commitments are still not very efficient.

The large transaction costs of buying and selling residential property provide hindrances to the efficiency of residential markets. Even professional investors and speculators find it exceedingly costly to deal in the market and maintain inventory of homes as investments (Shiller R. , 2007). These large transaction costs and cost of carry prevent homeowners from selling or buying their homes when they think the prices are overvalued or undervalued, thereby creating large swings in prices that can persist for many years. The large scale of the property market means that these distortions affect the national and even global financial markets which cause interest rates to fluctuate widely.

Interest rate volatility increases the risk of making fixed rate mortgage commitments, a common form of mortgages in the US, as well as pricing mortgages correctly (Thygeson, 1978). Financial institutions, homebuyers and homebuilders make large scale commitments based on the prevailing fixed rates which leads to considerable uncertainty in profits (Stevens, 1976), and even enormous losses over a very short span of time when these commitments are further leveraged, collateralized, and then leveraged again. Such large swings in prices, interest rates and profits give impetus to the use of derivatives by market participants to: stabilize these swings, predict future fluctuations and hedge their exposure. Since the United States is a global leader in mortgage derivatives, as will be discussed in the next section, it is also leading in developing information transparency and reliable real-estate indexes to properly price existing and future residential mortgages. While some relief is provided through interest rate futures contracts, this relief is only available for the cost of servicing the mortgage and not the underlying asset.

Overview of Available Derivatives Related to Real Estate Market

The real estate market is one of the largest asset classes in the world, however, it is among the least developed of all derivatives markets. For a derivatives market to be viable, there must be an efficient and accurate way of pricing the underlying asset. The National Council of Real Estate Investment Fiduciaries Property Index (NPI) has been in existence for over 20 years to assess the performance of commercial real estate. However, it was not until recently that much of the information on real estate transactions became transparent and cost-efficient enough to: accurately price and assess the residential market conditions, the creation of other price indexes, and creation of more efficient derivatives markets.

Derivatives markets allow for greater participation in the property markets by giving individuals exposure to real estate without large transaction costs, long lead times or capital requirements. Average real estate transaction costs are usually 7-8% of the value of the deal, whereas derivatives cost around 0.5% (Economist, Sep. 15, 2005). An increased participation in the market allows for higher liquidity and more accurate market responses, as derivatives can be tailored to meet the participants ' market outlook and future expectations.

The current mortgage derivatives market is dominated by swap agreements (Investopedia, 2008). Swap agreements involve interest rate and duration hedging and are based on property or rate indexes, such as the NPI, NAREIT, or the S&P/Case-Shiller. They allow the investor to swap exposure or simply the cash flows of different sectors or features of the market. For example, in an equity swap-format the investor exchanges returns of the retail real estate for residential real estate. Debt swaps, on the other hand, slice mortgage-backed securities (MBSs), created mostly by Fannie Mae and Freddie Mac, into four broad categories (Green & Wachter, 2005):

Sequential tranches - are securities where the cash flows from MBS are divided into different rating classes, such as junior and senior tranches. Investors in this market select the type of trench that suits them best, based on desired risk, reward and market outlook.

Planned amortization class (PAC) and companion bonds - are very popular with investors and are similar to tranches where the prepayments from MBSs are guaranteed, as long as mortgage prepayments

fall within a specified range. However, the covenants of these PACs can be risky when prepayments do not meet the required schedule.

Interest only (IO) and principal only (PO) strips - these separate principal and interest payments and sell them to desired investors based on their perceived market outlook. For example, if the investor believes that the interest rate is going to fall, then she would purchase a PO security that would increase in value as interest rates fall, because the principal payments would arrive faster. The reverse is true for IO strips; as rates fall so do values of IO strips.

Floater and inverse floaters - Floater are highly speculative short-term instruments, where the return on a floater changes with the changes in interest rate, while the value generally remains the same. Inverse floaters, on the other hand, are long-term instruments that are very sensitive to interest rate changes. Their return and values move in the opposite direction from interest rates.

These derivatives are crucial for the workings of American mortgage markets, however, they allow investors to gain exposure and hedging strategies based solely on interest rate fluctuations, and do not address the price fluctuations or lack forecasting of local real estate markets. Therefore, these derivatives are not very appropriate for individual investors wanting to protect their property against changes in residential prices (Caplin, et al., 2003). As a result, a number of researchers and economists have been trying to devise new indexes based on accurate residential property values in order to create a viable residential futures and options market.

“Starting a new market is like opening a nightclub. Lots of people will want to come if lots of people are there. But, if few people are there, few people want to come. Somehow, nightclubs do get started. So too, do real estate futures markets, but it will take time. The liquidity of the futures and options markets may be enhanced as other derivatives, such as index-linked notes, forwards and swaps take hold.” (Caplin, et al., 2003)

Interestingly enough, it was the London Futures and Options Exchange (London FOX) that launched the first property futures contracts in England in 1991. It was based on the single-family homes and commercial real estate. However, the low interest at the time prompted existing investors to perform wash trades and the market was shut down. The subsequent booms in the UK and US housing markets, revived interest in price-based residential derivatives, with spread betting based on new City Index in 2001, and covered warrants on UK home prices by Goldman Sachs on the LSE in 2003 (Shiller R. , 2007). In 2004, Hedgestreet.com allowed small bets (hedglets) to be placed on the direction of home prices in UK.

MacroMarkets LLC on the Chicago Mercantile Exchange (CME) launched the most recent and relatively successful derivatives market in 2006. It is based on the S&P/Case-Shiller Home Price Indices, which tracks prices of residential properties in 20 of the largest urban areas in US, based on weighted repeat home sales method. As the housing market in US stabilizes, one would expect a larger proliferation of home price indexes and derivative products designed specifically for residential property markets. As information costs and transparency improves, the new indexes will become more competitive and more accurate. The existence of multiple indices with different characteristics allows traders to explore arbitrage opportunities by trading across indices, as well as improve price discovery and efficiency of residential real estate markets (Clayton, 2007). As markets continue to develop in the US, and then the rest of the world, swaps or other new financial instruments would allow investors to gain exposure to international real estate markets.

Proposed Changes to the US Mortgage Market

Researchers have proposed changes to the current mortgage features which could be implemented quickly and efficiently. As interest rate and price changes can have devastating financial consequences for both the borrower and the lender, many of the proposed mortgage products attempt to share the price risk between the two. For over 20 years, Robert Shiller of Yale University and Karl Case of Wellesley College, have published papers outlining different strategies and derivative products that would improve the efficiency of the housing markets, as well as protect homeowners from interest rate and price shocks. Many of the proposed mortgage products are built upon their earlier work. This section outlines the more prominent proposals.

Home Equity Insurance

The idea of home equity insurance has been around for some time, however, it was not until the pilot projects in Oak County, and more recently in Syracuse, that it was seen as a viable solution to protecting residential home equity (Caplin, et al., 2003; Shiller, 2007). The basic premise is similar to most insurance contracts, for a fee the insurer provides a guarantee if the house values fall below a certain level. Oak County and Syracuse have instituted such programs after their residents suffered large-scale home equity declines. These cities wanted to halt the decline in prices and attract new homeowners, by providing protection for future price shocks.

Both projects were successful at halting vacancy rates and further decrease in prices, and many of the residents were willing to participate (Caplin, et al., 2003). The challenge of starting such a scheme on a national scale is synonymous to the housing market itself. Home equity reflects local market conditions, which means that insurance products must be tailored specifically to each geographic location. At the same time, recent improvements in local residential indices and forecasting techniques could enable a large-scale implementation in the future.

Participating Mortgages (PMs) and Shared Appreciation Mortgages (SAMs)

The basic premise of participating mortgages is to halt the foreclosure rates and increase homeownership by providing incentives to lenders to refinance mortgages when interest rates fall (Ebrahima, Shackletonb, & Wojakowskib, 2011). In Shared Appreciation Mortgages, the homeowner gives up a portion of their home equity appreciation with the lender, who in turn guarantees future refinancing at lower interest rates in times of crisis. By sharing in the upside payoff of home equity PMs make refinancing at lower rates attractive for both lenders and borrowers.

Proponents of PMs argue that it is a win-win arrangement for both parties to the contract and stress that these mortgages could be tailored to fit individual needs, whereby homeowners can give up the upside payoffs altogether, by receiving lower than market mortgage rates or higher loan-to-equity ratio (Jae & Renaud, 1997). The nation will most definitely face a repeat housing and financial crisis, as experienced in the recent sub-prime housing bubble, if they employ PMs solely to loosen mortgage standards to previous sub-prime mortgages levels.

Continuous Workout Mortgages (CWMs) and Adjustable Rate Mortgages (ARMs)

These mortgage contracts attempt to lower default risks when mortgage values begin to exceed the equity values as housing market conditions deteriorate. Current loan modification proposals that do not lower the principal balance have significant re-default rates (Adelino, Gerardi, & Willen, 2009). At the same time, the legal system and excessive paperwork required to foreclose or 'shortsale' a property creates a significant deadweight costs to both lender and borrower giving incentive them to participate in these products.

Continuous Workout Mortgages provide automatic adjustments to monthly payments for all homeowners based on an arbitrary home price index (Shiller, Wojkowski, Ebrahim, & Shackleton, 2011). As a result, the lender continues to receive a stream of payments without the need for costly renegotiations. Borrowers participate in the appreciation positive economic event and depreciation of equity as economy declines. Such an arrangement eliminates prepayment and default risks, by always keeping the mortgage values at par or slightly below home values. CWMs, however, will require accurate and efficient indices on which to base periodic payment adjustments. At the same time, American consumers accustomed to plain vanilla fixed rate mortgages and not typically versed in the intricacies of modern finance may not be willing to take on such a complex mortgage with uncertain future payments.

Adjustable Rate Mortgage proposed by Ambrose and Buttimer (2009) is much more palatable for future homeowners than CWMs and could be used by current mortgage lenders to gain a competitive edge in the mortgage market. Similar to CWMs, the mortgage payments are adjusted on a monthly basis and are based on some home-price index. The difference is that the balance is reset to the minimum of the prevailing property values or the value of the property at inception of the loan (original mortgage value). The price ceiling provides the homeowner with certainty of future mortgage payments while removing the incentive of defaulting on the loan as the value of home equity falls below the mortgage value. The lender, on the other hand, will not need to go through the costly transaction and legal costs associated with renegotiations, foreclosures and subsequent sales of those properties. As well, when the house markets begin to improve, the lenders will be the first to recover equity up to the value of the original contract. As price discovery and transparency of home markets continue to improve, CWMs and ARM should begin to gain ground and will be offered to new homeowners as an option to current mortgage contracts.

Although the proposed mortgage structures will make residential markets more efficient, and will create some protection for both borrowers and lenders, they do not address the momentum-caused volatility of spot house prices, nor the ability to forecast future house prices on a national or local level. These new mortgage contracts will have to rely on accurate and efficient indices: something that will only improve as more individuals enter the real estate market, and foster more financial innovation. The much lower transaction costs of derivative products, as well as reduced risks of exposure, will undoubtedly attract more investors to the property markets. These new investors will desire to either hedge their exposure or speculate on the discrepancies of housing markets and therefore begin to devise new and more accurate valuation methods and indices on which to base those derivative products.

Residential Property Derivatives: Weapons of Mass Destruction or Protectors of Homeowners

Well-developed residential property and mortgage derivatives can have profound social benefits by providing lower interest rates, better price discovery, lower effective house prices, and less volatility (Stevens, 1976). These derivatives can have numerous applications and benefits. Many of the advantages of futures markets being advocated are: hedging of price risk, enable exposure to different markets, and arbitrage opportunities. At the same time, well-developed markets could be utilized by a wide number of users, such as retiring homeowners wishing to protect their wealth, construction companies wishing to

lock in future cash flows, lenders hedging their exposure to fixed rate mortgages, investors wishing to align the risks of the portfolio to desired level, and many more (Deng, Quigley, & Van Order, 2000).

The volatility of spot prices, the inefficient forecasting of future house prices, the inability to hedge exposure to price and interest rate risk, and the inability to exploit discrepancies in the residential markets will continue to cause problems for American homeowners, financial institutions, the economy, and future prosperity. As exchange-traded futures and options markets were introduced to hedge against currencies' and other commodities' price volatility, a similar exchange-traded derivatives market could be deployed on a mass scale. The following three sections provide evidence that a derivatives market could be developed for American residential real estate market because an efficient residential derivatives market would: reduce spot price volatility, more efficiently yield current and future house prices and protect homeowners and lenders against future price and interest rate volatility.

Can Derivative Markets Stabilize Residential Spot House Prices?

The research on whether spot prices could be stabilized with futures markets has been debated for over a century. The debate focuses on speculators and their role in the markets; do they actually stabilize house prices through arbitrage and foster new innovative pricing techniques, or actually create larger swings in intraday prices by excessive positions in an attempt to beat the markets and its participants (Figlewski, 1981). As the real estate market has much higher information and transaction costs, this should mean that derivative products may be utilized as a cost effective solution to price discovery. However, testing such a theory would required more accurate home-price indices and many active participants; something lacking in current residential real estate markets.

The best evidence that a futures market could stabilize spot prices comes from a group of researchers in Hong Kong. Wong, et al., (2004) examined the volatility of spot house prices in Hong Kong before and after 1994, a period when new regulation prevented construction companies and brokers from arranging pre-sales of apartments, and again at the end of the decade, when the regulation was loosened. The result showed that volatility of spot prices increase significantly after the regulation was introduced and pre-sales were hampered. Furthermore, as the forward sale regulation was later relaxed, the spot price volatility decreased as well. The researchers concluded from their results, that pre-sales (forward contracts) have a dampening effect on the fluctuations of returns in the spot market.

Can Derivatives Efficiently Forecast Future Residential House Prices?

The previous section showed that there is evidence that a futures market stabilizes spot prices, but can a derivatives market effectively forecast future home prices, and in effect prevent future housing bubbles from developing? The research says yes, but it will take time to develop and become adopted on a large-enough scale to be efficient. As mentioned in previous sections, there are currently no relievable indexes that could be utilized for all residential houses in the United States, in order to efficiently forecast future spot prices. Making comparisons to other futures markets, such as oil futures, which tends to be in backwardation for half the time (Caplin, et al., 2003), is difficult because real estate is both consumption and an investment asset.

Shiller and Case (1989) have been attempting over the decades to devise a reliable index for residential home prices. Their earlier work focused on looking at ratios of rent cost and price, as well as construction cost and price, which they deducted, was analogous to calculating stock market returns based on dividend payments. In their later research, they removed all hedonistic variables and focused on the

weighted repeat sales method, to evaluate the price levels of houses in specific metropolitan locations in America (Baroni, Barthélémy, & Mokrane, 2008). Their efforts have gathered significant attention in recent years, by correctly predicting the collapse of the housing market in U.S., and the creation of a futures and options market on home equity values on the CME. Their latest prediction is that a Canadian real estate market is due for significant decline in the coming years (Thorpe J. , 2008).

Ebrahima, Shackletonb, & Wojakowskib (2011) examined the literature surrounding mortgage pricing and found that the Black-Scholes option pricing theory was applied to residential mortgages. These researchers demonstrated that a borrower's right to prepay was equivalent to an American call option. Further, the borrowers ability to default was similar to exercising a put option on the house. The high transaction costs and lack of information makes testing this hypothesis difficult, however, they concluded that similar to option holders, homeowners utilize these embedded call and put options only when it is in their best interest. As residential property information accuracy, transparency, and efficiency improves, along with enhanced localized indexes, options and futures pricing theories could be used to effectively price future spot prices, and in effect reduce the likelihood of high scale future price volatility.

Can Derivatives be used to Hedge Residential House Price risk?

Finance theory holds that all economic risk can be hedged for many different reasons; yet the biggest asset class in the world has relatively undeveloped derivatives market that could be utilized to exercise different hedging strategies. Hedging involves taking an equal and opposite position to the underlying asset in a financial instrument that would pay out in case of an undesired event, such as falling home prices (Stevens 1979). The large transaction costs, long lead times, and inability to sell properties short, imply that the residential property market needs a better-developed derivatives market in order to facilitate hedging strategies. For example, it would be impractical for new homeowners in Miami to sell their property when it becomes overpriced, and immediately move to New York where the prices are cheaper. Derivative products, in effect, provide a cost effective way of synthesizing required hedging strategies.

Residential mortgage contracts contain two main types of risk, default risk and prepayment risk. Prepayment risk arises when interest rates fall and homeowners pay off their mortgages faster, a loss to the lender. Default risk arises when the homeowner becomes unable to pay monthly payments or when the equity of the home falls below its mortgage value, at which point some homeowners choose to abandon their contracts. Default risk results in a loss to both the lender and the borrower. However, due to the existence of reliable indices, such as the NPI, commercial property derivatives are more developed than their residential counterparts and better protect its investors. Credit default swaps (CDSs) are used to hedge default risk while debt swaps are used to hedge both interest rate and default risk (Investopedia, 2008). This implies that, as better residential indexes become available, a reliable derivatives market will develop, and allow an array of hedging strategies.

One of the reasons homeowners have not considered using derivatives to hedge their price risk is due to the so-called self-hedge. A homeowner's self-hedge implies that most of the residential purchases are made for consumption and not for investment purposes (Han, 2008). People need to obtain shelter and they expect to use this shelter indefinitely, which means that fluctuations in the housing market do not affect them. As a result, they choose to enter the housing market early, regardless of housing market condition (Shiller R. , 2007). On the other hand, if they chose to delay their home purchase and choose to rent first, they expose themselves to rent price fluctuations and may find themselves without shelter in the future (Economist, Sep. 28, 2010).

For households, the self-hedge strategy is risky. Most new home purchases rely on some degree of leverage. If economic conditions worsen, homeowners will find themselves in a negative equity position and with current ridged mortgage terms, they may find themselves unable or unwilling to pay their monthly payments. Subsequent default and foreclosure on the property will ruin the homeowners' credit rating and hamper their ability to become homeowners in the future. The self-hedge theory also assumes that most residential purchases are for shelter, and that the workforce is geographically static. However, during the mid-2000s almost 40 percent of all residential purchases were for vacation or investment purposes (Jurgilas & Lansing, 2012), and many young employees, and future homeowners, expect to change jobs and careers regularly (Marantz Henig, 2010).

Another explanation for homeowners not hedging their property is that there has not been a reliable and efficient index available for residential real estate. One of the reasons commercial derivatives have proliferated is due to a reliable index, the NPI, which has been used to price most commercial derivatives for the past 20 years. Residential home price indexes, on the other hand, are only beginning to take root. The S&P/Case-Shiller Home Equity Index for residential home values in the US is now being used for futures and options trading on the CME. As participation in the CME, and other residential derivatives markets increases, indexes will become more accurate, efficient, and localized, which would foster even more derivative products and better hedging methods.

A report published in 2008, by Bertus, Hollans, and Swidler, used the Case-Shiller Index to test the hedging effectiveness of the CME futures and options on the Las Vegas real estate market. They wanted to know if the participants in the residential housing market had utilized hedging strategies prior to the crisis, could have avoided large-scale losses, as were actually incurred in the recent collapse of residential equity in Las Vegas. Their results were extremely promising and showed that if investment groups and mortgage holders used the CME futures as a hedge, they would have reduced their price risk by 88 percent. Their results also showed that homeowners without any leverage would also have fared well. Such results are encouraging, and give credence to using derivatives in volatile market conditions. Expanding their research to other cities and states could prove vital in convincing large financial institutions and investors to develop and participate in residential derivatives. As indexes for residential properties improve and new property derivatives are created, homeowners weary of past volatile housing markets will undoubtedly use some form of derivatives hedge to protect their equity risk.

Concluding Remarks

Real estate is one of the largest asset classes without a well-developed derivatives market. Experience shows that residential property is inherently risky and is prone to inefficiencies and price fluctuations. At the same time, determining the intrinsic values of residential properties involve a number of national and local fundamental factors that are confusing to even the most seasoned economists. The recent collapse of the housing market in U.S., followed by the collapse of the financial markets, proves that the residential housing market is problematic and incomplete in its current form. As a result, homeowners, investors, and financial institutions have no effective means of protecting their equity against future price risk.

This report demonstrated that the American residential real estate market is lacking an efficient and liquid derivatives market. As real estate indexes improve, coupled with more accurate and transparent information on local housing markets, participation rates will increase, and better derivative instruments will be created. As liquidity of those new instruments improve, spot home prices will become less volatile, and futures price discovery will improve. Furthermore, new residential derivatives could be successfully utilized as a hedge, and protect millions of homeowners, taxpayers, and financial institution against future house price shocks.

Further research should focus on addressing the effectiveness of using derivatives to hedge against price and interest rate risk over longer maturities, such as 10 - 30 years. New and better home price indexes could make this a viable option for future homeowners. As well, new mortgage contract should be developed in order to address the different characteristics of homeowners. Some homeowners buy houses and expect to live in them forever, while some would prefer the freedom to relocate as opportunities arise. The rigid structures of current mortgage contracts make frequent mobility a challenge to both the lenders and borrowers. Future research could focus on developing *Location Flexible Mortgages* that would allow for easy geographic mobility while staying under original, or easily adjustable, mortgage contract terms. Financial institutions are currently sitting on stockpiles of foreclosed and newly build houses throughout the county, which could be used to execute this strategy.

Appendix A:

Canadian House Prices 1999 - 2012



US House Prices 1998 - 2012



Source: Bloomberg Terminals at Memorial University on Newfoundland

Bibliography

- Adelino, M., Gerardi, K., & Willen, P. (2009). Renegotiating Home Mortgages: Evidence from the Subprime Mortgage Crisis . *Working Paper* .
- Adelino, M., Gerardi, K., & Willen, P. (2006, Jul. 6). Why Didn't Lenders Renegotiate More Home Mortgages? Redefaults, Self-Cures and Securitization. *FRB Public Policy Discussion Paper No 09-4* .
- Ambrose, B. W., & Buttimer, R. J. (2009). The adjustable balance mortgage: Reducing the value of the put . *Penn State University Working Paper* .
- Baroni, M., Barthélémy, F., & Mokrane, M. (2008). Is It Possible to Construct Derivatives for the Paris Residential Market? *Journal of Real Estate Finance and Economics* , 37 (3), 233–264.
- Benítez-Silva, H., Eren, S., Heiland, F., & Jiménez-Martín, S. (2008). How Well Do Individuals Predict the Selling Prices of Their Homes? . *Unpublished paper*.
- Bertus, M., Hollans, H., & Swidler, S. (2008). Hedging House Price Risk with CME Futures Contracts: The Case of Las Vegas Residential Real Estate. *Journal of Real Estate Finance Econ* , 37, 265–279.
- Campbell, J. Y., & Cocco, J. (2003). Household Risk Management and Optimal Mortgage Choice., *Quarterly Journal of Economics* , 118 (4), 1449–1494.
- Caplin, A., Goetzmann, W. N., Hangen, E., Nalebuff, B. J., Prentice, E., Rodkin, J., et al. (2003, Oct). Home equity insurance: a pilot project. *Yale International, Center for Finance Working Paper* , 03–12.
- Case, K. E., & Shiller, R. J. (2004). Is There a Bubble in the Housing Market? *Brookings Papers on Economic Activity* , 2, 29.
- Case, K. E., & Shiller, R. J. (1989, MARCH). The Efficiency of the Market for Single-Family Homes. *The American Economic Review* , 125.
- Case, K. E., Quigley, J., & Shiller, R. (2005). Comparing Wealth Effects: The Stock Market versus the Housing Market . *Advances in Macroeconomics* , 5 (1).
- Case, K., & Shiller, R. (1990). Forecasting Prices and Excess Returns in the Housing Market . *AREUEA Journal* , 18 (3).
- Cho, M. (2004). Evolution of the U.S. Housing Finance System: A Historical Survey and Lessons for Emerging Mortgage Markets . *Working paper* .
- Clayton, J. (2007). Commercial real estate derivatives: the developing USA market . *Real Estate Issues* , Fall, 33-40.
- Deng, Y., Quigley, J., & Van Order, R. (2000). Mortgage Terminations, Heterogeneity, and the Exercise of Mortgage Options. *Econometrica* , 68 (2), 275-301.
- Diamond, D. (2004, Jun). Overview of Housing Finance Systems . *Wharton School. Working paper* .

Ebrahima, M. S., Shackletonb, M., & Wojakowskib, R. (2011, Apr. 18). Participating mortgages and the efficiency of financial intermediation . *The Journal of Banking and Finance* .

Economist. (Jul 9, 2009). *Mortgage mistakes: Modifying delinquent loans*.
<http://www.economist.com/node/13998732>

Economist. (May 17, 2007). *Housing Market: Black boxes*. <http://www.economist.com/node/9141547>

Economist. (Mar. 3, 2011). *Bricks and slaughter: Property is widely seen as a safe asset*.
<http://www.economist.com/node/18250385>

Economist. (Sep. 15, 2005). *Fear of flying: Britain's fledgling property-swaps market stretches its wings* .
<http://www.economist.com/node/4408027>

Economist. (Feb. 25, 2012). *From vanilla to rocky road: The Darwinian evolution of exchange-traded funds*. <http://www.economist.com/node/21547989>

Economist. (Apr. 20, 2006). *Homes with hedges: Applying modern finance to America's biggest asset class* . <http://www.economist.com/node/6836957>

Economist. (Sep. 28, 2010). *Housing as hedge* . Retrieved from Economist Free Exchange:
http://www.economist.com/blogs/freeexchange/2010/09/housing_markets_6

Economist. (Sep. 8, 2010). *Housing markets: The big housing question*. Retrieved from Economist Free Exchange: http://www.economist.com/blogs/freeexchange/2010/09/housing_markets_1

Economist. (Dec 30, 2012). *Housing markets: Crash points* . Retrieved from Economist Free Exchange:
http://www.economist.com/blogs/freeexchange/2010/12/housing_markets_0

Economist. (Jun 23, 2009). *Markets are irrational. Are they inefficient?* . Retrieved from Economist Free Exchange: http://www.economist.com/blogs/freeexchange/2009/06/markets_are_irrational_are_the

Economist. (Aug. 08, 2009). *Spark of invention: A new way for homeowners to hedge themselves against property crashes*. <http://www.economist.com/node/14258966>

Economist. (Aug. 4, 2012). *The housing market: Pulling its weight at last* .
<http://www.economist.com/node/21559923>

Economist. (Mar. 3, 2011). *The old and the new: The crisis has spurred innovation in commercial property*. <http://www.economist.com/node/18250411>

Ederington, L. (1979). The Hedging Performance of the New Futures Markets . *he Journal Of Finance* , XXXIV (1).

Fabozzi, F. J., Shiller, R., & Tunaru, R. (2010). Property Derivatives for Managing European Real-Estate Risk. *European Financial Management* , 16 (1), 8-26.

Feldstein, M. (2009, August 7). "How to Save an 'Underwater' Mortgage,". Retrieved from The Wall Street Journal: <http://online.wsj.com/article/SB10001424052970204908604574330883957532854>

Figlewski, S. (1981). Futures trading and volatility in the GNMA market. *Journal of Finance* , 36 (2), 445-456.

- Glaeser, E. (2009, Jun 23). *No Such Thing as a Free Lunch, Revisited* . Retrieved from New York Times: <http://economix.blogs.nytimes.com/2009/06/23/no-such-thing-as-a-free-lunch-revisited/>
- Glaeser, E., & Gyourko, J. (2007, Dec. 15). Arbitrage in Housing Markets . *Prepared for the Lincoln Land Institute conference "Housing and Built Environment: Access, Finance, Policy"* .
- Glick, R., & Lansing, K. (2010, Jan. 11). Global Household Leverage, House Prices, and Consumption. *FRBSF Economic Letter* .
- Green, R. K., & Wachter, S. (2005). "The American Mortgage in Historical and International Context. *Journal of Economic Perspectives* , 19 (4), 93–114.
- Greenspan, A. (2004, Dec. 14). *Federal Open Market Committee. "Minutes."* <http://www.federalreserve.gov/fomc/minutes/20041214.htm>. Retrieved from Federal Reserve Board of Governors: <http://www.federalreserve.gov/fomc/minutes/20041214.htm>
- Han, L. (2008). Hedge House Price Risk in the Presence of Lumpy Transaction Costs. *Journal of Urban Economics* , 64 (2), 270-287.
- Hwang, M., & Quigley, M. J. (2006). Economic Fundamentals In Local Housing Markets: Evidence From U.S. Metropolitan Regions. *Journal Of Regional Science* , 46 (3), 425–453.
- Investopedia. (2008, Jul 31). *A Guide To Real Estate Derivatives*. <http://www.investopedia.com/articles/optioninvestor/08/real-estate-derivative.asp#axzz22LPBUnRN>
- Jaee, D., & Renaud, B. (1997). Strategies to develop mortgage markets in transition economies. In J. Doukas, V. Murinde, & C. Wihlborg, *Financial Sector Reform and Privatization in Transition Economies* (pp. 69–93). Netherlands: Elsevier Science B. V.
- Jurgilas, M., & Lansing, K. (2012, Jun. 25). Housing Bubbles and Homeownership Returns. *FRBSF ECONOMIC LETTER* .
- Leonhardt, D. (2005, Dec 25). *2005: In A Word; Frothy* . Retrieved from New York Times: <http://query.nytimes.com/gst/fullpage.html?res=9806E6D81530F936A15751C1A9639C8B63>
- Marantz Henig, R. (2010, Aug 18). *What Is It About 20-Somethings?* . Retrieved from New York Times: <http://www.nytimes.com/2010/08/22/magazine/22Adulthood-t.html?pagewanted=all>
- Modigliani, F. (1974, June 24-26). Some Economic Implications of the Indexing of Financial Assets with Special Reference to Mortgages. *Paper Presented at the Conference on the New Inflation, Milano, Italy*, .
- Observatory, E. (2012, Mar. 9). *U.S: Housing Market Outlook: 2012* . Retrieved from FXstreet.com: <http://www.fxstreet.com/fundamental/analysis-reports/economic-observatory/2012/03/09/>
- Otake, M., & Kawaguchi, Y. (2002). 'Hedging and pricing of real estate securities under market incompleteness',. *Working Paper (MTB Investment Technology Institute Co., Ltd., .*
- Salmon, F. (2010, Dec. 29). *Housing: Ackman vs Shilling*. Retrieved Jul. 16, 2012, from Reuters Blog: <http://blogs.reuters.com/felix-salmon/2010/12/29/housing-ackman-vs-shilling/>

Shiller, R. (2007, Feb. 2007). Derivatives Markets for Home Prices. in *Housing Markets and the Economy: Risk, Regulation, and Policy: Essays in Honor of Karl E. Case*, ed. by E. L. Glaeser, and J. M. Quigley, chap. 2, pp. 17–33. *Lincoln Institute of Land Policy, Cambridge, Massachusetts*, Papers from a conference sponsored by the Lincoln Institute of Land Policy, held in December 2007.

Shiller, R. (2008, Mar. 2). *How a Bubble Stayed Under the Radar*. Retrieved from New York Times ECONOMIC VIEW: <http://www.nytimes.com/2008/03/02/business/02view.html?pagewanted=1&r=3>

Shiller, R. J., & Weiss, A. (1999). Evaluating Real Estate Valuation Systems . *Journal of Real Estate Finance and Economics* , 18 (2), 147-161.

Shiller, R. J. (2008, Sep 20). *The Mortgages of the Future* . Retrieved from New York Times: <http://www.nytimes.com/2008/09/21/business/21view.html>

Shiller, R. J. (2007, Oct. 18). Understanding Recent Trends in House Prices and Homeownership. *Kansas City Federal Reserve Bank, Jackson Hole Conference Proceedings* .

Shiller, R., Wojkowski, R., Ebrahim, M., & Shackleton, M. (2011). Continuous Workout Mortgages. *Cowles Foundation Discussion Paper No. 1794*, .

Shilling, G. A. (2010, Dec. 29). *GARY SHILLING: And Now House Prices Will Now Drop Another 20%* . Retrieved from Gary Shilling & Co.: <http://www.businessinsider.com/gary-shilling-and-now-house-prices-will-now-drop-another-20-2010-12?op=1>

Stevens, N. (1976). A Mortgage Futures Market: Its Development, Uses, Benefits and Cost. *Review of the Federal Reserve Bank of St. Louis*.

Thomas, J., & Van Order, R. (2011). A closer look at Fannie Mae and Freddie Mac: What we know, what we think we know and what we don't know. *Draft Paper, George Washington University, Department of Finance*.

Thorpe, J. O. (2008, Oct 1). *Canada may face housing bust: Shiller* . Retrieved from Financial Post: <http://www.financialpost.com/story.html?id=853094>

Thygeson, K. (1978). Hedging Forward Mortgage Loan Commitments: The Option of Futures and a Future for Options. *AREUEA Journal* , 6, 357.

Wong, S. K., Yiu, C. Y., Tse, M. K., & Chau, K. W. (2004, October). Do the Forward Sales of Real Estate Stabilize Spot Prices? . *Hong Kong Institute of Economics (Working Papers)* .

Woodwell, J. (2009, Oct.). A new blueprint for the secondary mortgage market. *Mortgage Banking* .

The Role of Financial Ethics in an Economic Crisis

Kyle Hickey*, Tom Cooper** and Alex Faseruk***

Abstract

We discuss the role that behavioral finance plays in an economic crisis. Specifically, it will analyze the influence financial ethics have on the overall health of a capital market and its relative economy. In doing so, this paper will discuss the need for an increase in the presence of a consistent code of conduct within the financial sector. In order to explore the role of financial ethics, we will discuss the role that ethical behavior has in a financial crisis by examining two unique periods the Global Financial Crisis (2008) and the Dot-Com Bubble (2000).

Introduction

Since the Global Financial Crisis, the financial sector has largely become hailed as the industry that almost brought a capitalist society to its knees (Cheng, 2011); spectators and participants alike now outline the importance of financial ethics in averting a financial crisis (“Can financial”, 2011).

The following paper will discuss the role that behavioral finance, defining behavioral finance as the use of psychologically based analysis (including attitudes) to explain market anomalies (Helberger, 2012), plays in an economic crisis. Specifically, it will analyze the influence financial ethics have on the overall health of a capital market and its relative economy. In doing so, this paper will discuss the need for an increase in the presence of a consistent code of conduct within the financial sector.

We define an economic crisis as a period of negative economic consequence. Specifically, we will adapt the Nazlioglu et al. (2012) definition of an economic crisis whereby it is an event that is generally represented by one or more of the following²: banking panics, bursting of financial bubbles, currency crises, stock market crashes, sovereign defaults (please note that this list is not comprehensive. Instead, it highlights several of the more commonly understood causes of an economic crisis).

To this end, an economic crisis is generally correlated with a sharp and/or sustained reduction in the value of an equity market (Yalamova & McKelvey, 2011). This reduced value typically results in a negative economic impact (i.e. increased unemployment rate). Of note, similar to Bryan (2012), the terms ‘economic crisis’ and ‘financial crisis’ will be used interchangeably.

Although there is no standard way of organizing the history of modern moral philosophy and the field of ethics, it is useful to think of it having a number of stages (Schneewind 1993 p.147) with the he last and current stage has seen the attention of ethics shift away from the problem of the autonomous individual toward new issues concerning public morality. The rise of applied ethics - medical ethics, legal ethics, even engineering ethics as sub-disciplines - exemplifies this trend.

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Business ethics has come to the forefront in the growth of applied ethics and is manifested in issues concerning the social responsibility of business. The term ‘financial ethics’ is somewhat subjective and can at times be relatively inconsistent (Stephens et al., 2012). To circumvent this, we will consider the term ‘financial ethics’ a deduction of the Chartered Financial Analyst (CFA) Institute’s Code of Ethics and Standards of Professional Conduct (Appendix A). Generally, the code commits charter holders to “lead the investment profession globally by setting high standards of education, integrity and professional excellence.” (Chartered, 2010) Specifically, Table 1 presents a verbatim description of the CFA Institute’s Code of Ethics (Chartered, 2010).

*****Insert Table 1 Here*****

In order to explore the role of financial ethics, we will discuss the role that ethical behavior has in a financial crisis by examining two unique periods:

- Discussion One: Global Financial Crisis (2008)
- Discussion Two: Dot-Com Bubble (2000)

Additionally, the paper will then discuss two unique issues that were somewhat dormant during the two noted crises:

- Issue One: Fiat currencies
- Issue Two: Domestic debt & demographics

While this is not a comprehensive list of financial crises and underlying issues, preference has been given to the study of these two periods and issues because together they embody characteristics common to most financial crises (Hartz, 2012; Levine, 2012; Morgan, 2012). This paper will then discuss and analyze each crisis and issue in solitude and identify areas in which unethical financial actors may have contributed. This will be followed with a collective examination of the periods and issues to draw relevant conclusions.

Financial Crises

Global Financial Crisis

Largely considered the most the severe financial catastrophe since the Great Depression (Svetlova, 2012), the Global Financial Crisis (GFC) has become the subject of countless publications. Its global impact was near crippling and economies around the world quickly entered into what has become coined the Great Recession (Yalamova & McKelvey, 2011; Farmer, 2012).

Peaking in mid-2007, U.S. equity markets quickly lost value, bottoming in early 2009 with a posted loss of over 40% on the S&P 500 (Browning, 2011). Figure 1 graphically (using Google’s online financial charting software: <http://www.google.com/finance>) depicts the decline of the S&P 500 index and subsequently the popularized beginning of the GFC.

*****Insert Figure 1 Here*****

Regulation

While the term GFC gained notoriety in mid-2008 (Svetlova, 2012), many academics assert that the crisis was in fact rooted in a history of U.S. policy that emphasized continued financial deregulation (Carow et al., 2011; Cheney, 2011; Crawford, 2011). Bryan (2012) suggested that such deregulation is partially to blame for what he considers “a perpetual crisis of finance” that expands well beyond the confines of the GFC. Carow (2011) and Crawford (2011) further this logic by arguing that the 1999 repeal of the Glass-Steagall Act of 1933 was the single most significant regulatory contribution to the GFC.

Following the crash of 1929, the Glass-Steagall Act of 1933 was introduced to ban commercial banks from underwriting securities and effectively separated the interests of commercial and investment banking (Carow, 2011; Crawford, 2011). The 1999 repeal of the act “set the stage for complete network integration and therefore massive contagion.” (Mayer, 2009)

Commercial and investment banks are entirely different entities and the marriage of the two, as permitted by the repeal of the Glass-Steagall Act of 1933, in effect facilitated a conflict of interest (Carow, 2011; Crawford, 2011). A commercial bank is primarily concerned with making secure loans while an investment bank is primarily concerned with selling paper-based assets. “You cannot mix the culture of investment banking (where risk taking is key) and commercial banking (where prudence is vital) under one roof.” (The long, 2003)

Prior to this repeal though, the limits imposed on banking by the Glass-Steagall Act of 1933 “were roundly condemned through the entire cadre of academic and corporate economists.” (Mayer, 2009) The Act was considered a cast that inhibited economic growth and was seen as somewhat redundant under the lens of an efficient market (“The long”, 2003). Because policy makers and financial actors subscribed to Fama’s (1970) Efficient Market Hypothesis, the Glass-Steagall Act of 1933 was finally repealed in 1999 under the Clinton Administration (“Can financial”, 2011).

In essence, the absence of the Glass-Steagall Act of 1933 reduced regulatory oversight and allowed commercial banks to increase their risk exposure by selling mortgage back securities (MBS) and credit default swaps (CDS) (Carow et al., 2011; Cheney, 2011; Crawford, 2011).

U.S. Housing and Over Leverage

One significant prelude to the GFC was the bursting of the U.S. housing bubble in 2006 (Byun, 2010). During the housing boom, financial institutions that were now amalgamations commercial and investment banks calculated risk with a relatively narrow perspective of market volatility (Brigo & Chourdakis, 2009). Under this volatility constraint, these banks issued mortgage backed securities (MBS) and credit default swaps (CDS) to give additional liquidity to the housing and credit markets (Petrova, 2009). Because an MBS is a mortgage derivative, its value is wholly connected to the value of the U.S. housing market; a dramatic reduction in U.S. property value would be consequential to the holder of a MBS (Petrova, 2009).

The risk profile of such derivatives was amplified in the consumer market as households extracted increasing sums of cash from the perceived equity in their homes. In 2005, relatively relaxed lending standards allowed consumers to extract approximately USD 1,148.9 billion in cash, well above the 1996 extraction of USD 277.1 billion (Greenspan & Kennedy, 2007).

Table 2 is an adaptation of Greenspan and Kennedy’s (2007) study of the extraction of home equity by consumers.

Such a growth in cash extraction coincided with an increased U.S. household debt. “On average, consumers from 1950 to 1985 saved 9% of their disposable income. That savings rate then steadily

declined to around zero [in early 2008]. At the same time, consumer and mortgage debts rose to 127% of disposable income, from 77% in 1990.” (*The Economist*, 2008)

*****Table 2 1 Here*****

*****Insert Figure 2 Here*****

*****Insert Figure 3 Here*****

The increased debt of the U.S. consumer in conjunction with the issuance of MBSs, CDOs and CDSs placed all actors (commercial, investment and consumer) at the mercy of the interest rate. As interest rates began to increase, the value of the U.S. housing market began to decrease. This loss of value resulted in homes being worth less than their relevant mortgages and subsequently incentivized foreclosure (Dokko et al., 2011). Such created a cycle that crippled financial institutions insufficiently prepared to deal with a dramatic influx of defaults and overleveraged consumers (Dokko et al., 2011; Greenspan & Kennedy, 2007; Meric et al., 2011).

Analysis of GFC

In relatively straightforward terms, the above depicts a sequential set of events that all but encouraged the GFC. Considering these events in isolation, it is evident that financial actors played a significant role in the onset of the GFC. In all cases it seems that these actors violated Item Two of the CFA Code of Ethics and placed the interest of the firm over that of the client. Here, it is apparent that greed on the behalf of the banking industry fostered an irresponsible risk appetite and created a vicious, credit addicted economic cycle.

In particular, the issuance of exotic derivatives such as MBOs was an irresponsible act on the behalf of financial professionals and signaled little to no economic foresight. As noted though, this act was permissible given the 1999 repeal of the Glass-Steagall Act of 1933, and as such highlights a basic economic principal: people and organizations will collectively act in a manner that maximizes utility.

To this end, the violation of Item 5 of the CFA Code of Ethics was arguably in part and highlights the noted lack of regulatory structure in the U.S. financial system. In this case a clear lack of regulation allowed many financial institutions to act in a self-destructive manner while still abiding by the appropriate legislative framework.

Had the full spectrum of financial actors adhered to the CFA Code of Ethics, the impact of the GFC may have been reduced. This stems from the notion that practitioners of the code would have been diligent (Item 1) and would not have allowed the commercial banking sector to assume a level of risk more appropriate for an investment bank. That said though, low interest rates translated into cheap credit for U.S. consumers and subsequently increased U.S. household leverage. While this thought does not dismiss the lack of foresight in the investment community, it does emphasize the willingness of the U.S. consumer to assume financial leverage.

Dot-Com Bubble

In financial terms, a bubble is a speculative period in which the value of assets surge to levels that cannot be fundamentally justified (Glaum & Friedrich, 2006). They tend to “emerge at times when investors profoundly disagree about the significance of a big economic development” and often surround particular

sectors (Lahart, 2008). In the case of the dot-com bubble, the Internet was that economic development and technology was that particular sector.

From the height of the bubble in March 2000, U.S. equity markets quickly eroded. The heavily exposed NASDAQ lost approximately 80% of its value in 24 months while the S&P 500 posted loss of 45% during the same period³. Figure 4 graphically⁴ depicts the decline of the NASDAQ and S&P 500 indices and subsequently the famed burst of the dot-com bubble.

Media

“Although the news media present themselves as detached observers of market events, they are themselves an integral part of these events.” (Shiller, 2001) To this end Shiller (2001) argues that the news media are essential vehicles for the rapid spread of ideas and as such are an influential force in the capital markets.

In terms of the dot-com bubble, several academics accuse the news media of exaggerating the economic benefits of the Internet and subsequently feeding much of the speculation therein (Edward, 2011; Shiller, 2001). For the most part however, such statements use case studies to compare other events to the dot-com bubble.

For example, several publications (Neff, 1995; Nelan & Desmond, 1995; Shiller, 2001) cite a case study of the Nikkei index’s reaction to a 1995 earthquake in Kobe, Japan. On January 17, 1995 a 7.2 magnitude earthquake (Richter scale) struck Kobe. Interestingly though, the index remained relatively unchanged until January 23 when it dropped 5.6% (Neff, 1995; Nelan & Desmond, 1995). In terms of the capital markets, the news media initially portrayed the earthquake as “economically ambiguous” (Shiller, 2001) and noted that the new wave of spending on reconstruction might actually stimulate the economy.

However, over the six-day period following the earthquake, the news media continually highlighted over \$100 billion (USD) in damages and markets around the world began to tick down on worries of the commercial impact of a Tokyo centered earthquake (Neff & Holyoke, 1995). While seemingly anecdotal, this case study does highlight the effect that news media can have on a capital market. It is not however consistent with the efficient market hypothesis (EMH).

In general, the popularized EMH notes that a capital market is efficient in that it reacts to news (different from news media) in an immediate fashion (Fama, 1970). Under this lens, the news media would have had no net effect on the creation of the dot-com bubble as the EMH assumes that the market disregards popular opinion and prices assets relative to all available information (Fama, 1970).

Additionally, in their 2009 study, Bhattacharya et al. show that while media coverage was more positive for Internet IPOs than for non-Internet firms, such coverage was not a significant factor in the build up of the dot-com bubble. The study found that “media explained only 2.9% of the difference between Internet and non-Internet firm returns from January 1, 1997 to March 24, 2000.” This study discounted the effect of media on the bubble and somewhat confirmed the market’s disregard for media sentiment and its tendency toward the EMH.

Accounting

³ These values are deduced from Figure 4

⁴ This chart was created using Google’s online financial charting software: <http://www.google.com/finance>

As noted, the Internet was a significant innovation of which the future economic value was difficult to forecast (Glaum & Friedrich, 2006; Lahart, 2008). Its potential economic benefit caused investors to speculate, irresponsibly giving abnormal valuations to firms that showed little or no revenue. According to Demers et al. (2010) and Glaum & Friedrich (2006), weak accounting fundamentals significantly contributed to the dot-com bubble. Collectively, the authors note that in particular, weak accounting fundamentals at the time of an initial public offering (IPO), “offer significant explanatory power in describing ex post Internet IPO failures.” (Demers et al, 2010)

In this respect, investors ignored basic financial accounting information and disregarded the value structure of innovative IPOs outside of the technology sector. This resulted in investors bidding up the value of the NASDAQ and subsequently taking on a level of risk and exposure not suitable for the underlying financial fundamentals (Demers et al, 2010; Glaum & Friedrich, 2006; Lahart, 2008).

Demers et al. (2010) additionally argue that sector-wide weak accounting metrics should have served as a warning indicator in the “euphoric rise of the Internet industry.” To this end, the authors argue that the unsubstantiated rapid growth in value of Internet industry could have been somewhat mitigated with the use of responsible fundamental accounting techniques.

Analysis of Dot-Com Bubble

It seems the most significant factor in the creation of the technology bubble is a failure of analysis and a subscription to the euphoric hype that resulted in its build up. Because financial actors were making investment decisions without considering the collective fundamentals of Internet firms they were acting irresponsibly.

Item 3 of the CFA Code of Ethics⁵ entrusts participants to act with reasonable care and to exercise independent professional judgment in the investment analysis process. Such conduct should have warranted a diligent investment analysis whereby fundamental and prospective values should have been compared to other innovative, non-Internet IPOs. In this respect, had all actors practiced diligence and ignored the hype surrounding the build up of the dot-com bubble there may have never been a bubble to begin with.

Discussion

The GFC and Dot-Com Bubble describe two unique economic crises confined to two unique periods of time. As such, a study in this respect is somewhat limited as it discounts factors that may be periodically dormant yet present a continual, underlying threat to the capital markets.

This section will briefly address other continual threats to the capital markets in an attempt to give a more rounded picture of the role that financial ethics play in a financial crisis. In particular, this section will address Fiat Currencies as well as Domestic Debt and Demographics.

Fiat Currencies

Traditionally, international transactions were made using precious metals such as gold and silver; as the volume of international trading dramatically increased during the 19th century however, such transactions

⁵ Use reasonable care and exercise independent professional judgment when conducting investment analysis, making investment recommendations, taking investment actions, and engaging in other professional activities. (Chartered, 2010)

became nearly impossible. This resulted in the introduction of paper money whereby a country had to guarantee it had gold and silver reserves equal to the amount of paper currency in circulation (gold standard) (Eichengreen, 2012).

The economic downturn of the Great Depression (1929) however, and the cost of funding three wars⁶ required a large quantity of money to be printed and eventually forced the Nixon administration to abandon the gold standard in 1971 (Forbes, 2011). This caused exchange rates and currencies to float against one another and subsequently left governments free to print money (Schaefer, 2012).

Not surprisingly, this change in monetary policy emphasizes a government's role in the financial markets. Because currencies are no longer tied to a fixed commodity and because governments have the ability to freely print money, government monetary policy has a significant effect on exchange rates and inflation. A large injection of print money into an economy can temporarily boost an economy but can also increase the rate of inflation (Nias, 2011). In this respect, even if all financial actors strictly abided by the six items in the CFA Code of Ethics they would still be subject to the monetary policy of the ruling government.

Domestic Debt and Demographics

The total debt for all sectors of the U.S. economy is approximately 350% of GDP, 150% above what is considered a healthy ratio of debt to growth. This fact was highlighted on August 5, 2011 when Standard & Poor's downgraded the country from AAA to AA+ noting that (Hamid, 2011):

“More broadly, the downgrade reflects our view that the effectiveness, stability, and predictability of American policymaking and political institutions have weakened at a time of ongoing fiscal and economic challenges to a degree more than we envisioned when we assigned a negative outlook to the rating on April 18, 2011.”

Theoretically, a lower domestic credit rating correlates with a higher yield on government bonds as a lower credit rating implies a higher risk of default. This is directly relevant to an economy as it heavily influences exchange and interest rates (Afonso et al., 2012). Periods of high yields on government bonds for example, generally coincide with periods of high inflation. In this respect, abusive fiscal policy can have a dramatic effect on a resident economy (Farmer, 2012).

Additionally, a government not meeting its debt obligations may subsequently be forced to increase taxes, make dramatic spending cuts or default on its debt (Afonso et al., 2012). Such measures hinder economic growth and as such may be the catalyst of an economic crisis.

Of note, many fiscal policies with respect to government spending assume sustainability by placing current obligations on future taxpayers (Morgan, 2012). A demographically shifting nation with more people entering retirement than the labor force may find its tax base constrained and forced to face a debt induced economic crisis.

Similar to the repeal of the Glass-Steagall Act of 1933, these points again highlight the importance of policy in the onset of an economic crisis. To this end, financial actors on an individual level may be relatively helpless, regardless as to whether or not they strictly adhere to the CFA Code of Ethics.

Conclusion

⁶ World War I, World War II and Vietnam War

This paper discussed two economic crises in detail: the Global Financial Crisis and the Dot-Com Bubble. In considering them collectively, both cases cited instances of unnecessarily high-risk exposure. It thus seems that strict adherence to the CFA Code of Ethics can reduce the impact of a financial crises in that actors are forced to participate in a more diligent and responsible manner. This diligent and responsible manner should normalize the risk exposure of an investment portfolio and subsequently reduce the euphoria that contributes to a financial crisis.

That said, the underlying policy of an economic region (fiscal, monetary and regulatory) seemed to trump the adherence to the CFA Code of Ethics. In this respect, for an economic crisis to be averted effective policy needs to be implemented by the reigning government. However, strict adherence to the CFA Code of Ethics, under economic policy (fiscal, monetary and regulatory) can reduce the likelihood of a major financial crisis.

TABLE 1: CFA Institute Code of Ethics (Chartered, 2010)

Item 1: Act with integrity, competence, diligence, respect, and in an ethical manner with the public, clients, prospective clients, employers, employees, colleagues in the investment profession, and other participants in the global capital markets.

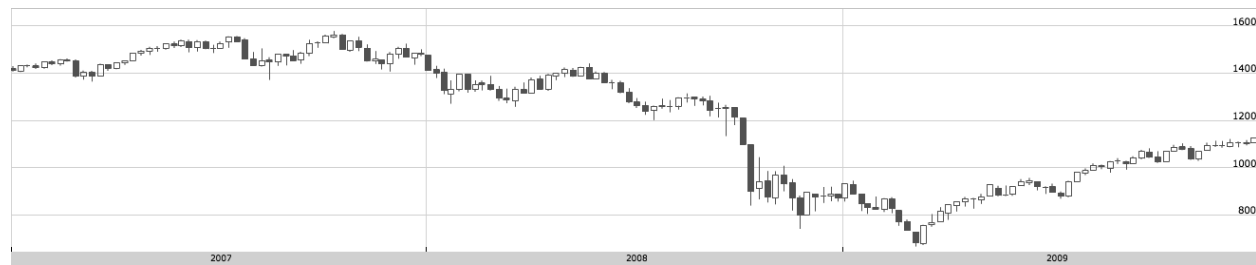
Item 2: Place the integrity of the investment profession and the interests of clients above their own personal interests.

Item 3: Use reasonable care and exercise independent professional judgment when conducting investment analysis, making investment recommendations, taking investment actions, and engaging in other professional activities.

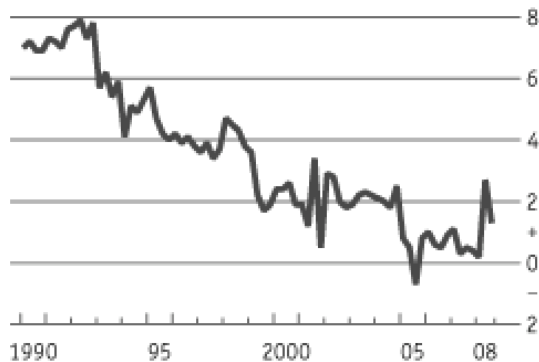
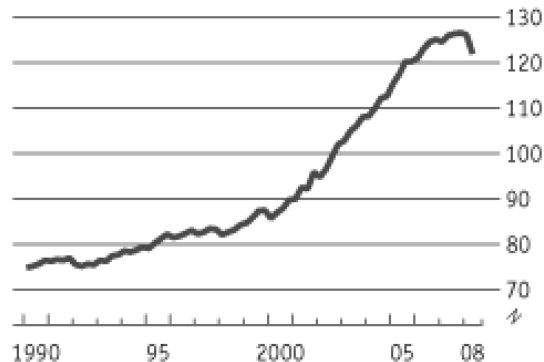
Item 4: Practice and encourage others to practice in a professional and ethical manner that will reflect credit on themselves and the profession

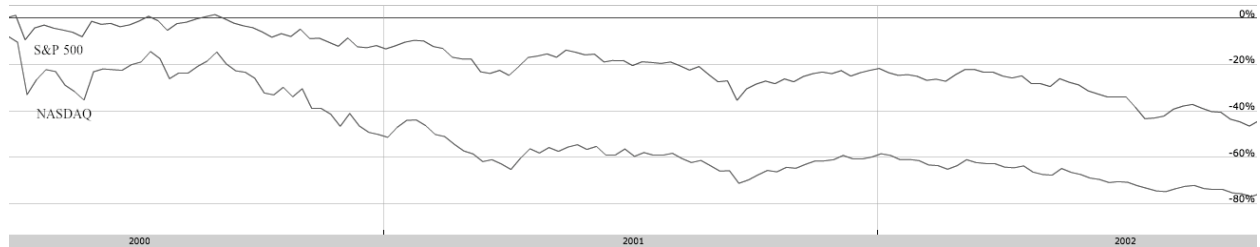
Item 5: Promote the integrity of and uphold the rules governing capital markets.

Item 6: Maintain and improve their professional competence and strive to maintain and improve the competence of other investment professionals.

FIGURE 1: S&P 500 (JAN-07 TO DEC-09)**TABLE 2: FREE CASH FROM EQUITY EXTRACTION (BILLIONS OF DOLLARS)**

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Home equity extraction	277.1	276.0	346.9	467.2	553.4	626.9	757.8	1,003.3	1,170.1	1,148.9

FIGURE 2 (*The Economist*, 2008):
PERSONAL SAVING AS % OF DISPOSABLE INCOME**FIGURE 3 (*The Economist*, 2008):**
HOUSEHOLD DEBT AS % OF DISPOSABLE INCOME**FIGURE 4: S&P 500 AND NASDAQ INDICIES (MAR-00 TO OCT-02)**



Bibliography

(2008, November 20). The end of the affair. *The Economist*. [Retrieved] 2012, March 18, [from] http://www.economist.com/node/12637090?story_id=12637090

Afonso, A., Furceri, D., & Gomes, P. (2012). Sovereign credit ratings and financial markets linkages: Application to European data. *Journal Of International Money & Finance*, 31(3), 606-638.

Bhattacharya, U., Galpin, N., Ray, R., & Yu, X. (2009). The Role of the Media in the Internet IPO Bubble. *Journal Of Financial & Quantitative Analysis*, 44(3), 657-682.

Bhattacharya, N., Demers, E., & Joos, P. (2010). The Relevance of Accounting Information in a Stock Market Bubble: Evidence from Internet IPOs. *Journal Of Business Finance & Accounting*, 37(3/4), 291-321.

BRIGO, D., & CHOURDAKIS, K. (2009). COUNTERPARTY RISK FOR CREDIT DEFAULT SWAPS:: IMPACT OF SPREAD VOLATILITY AND DEFAULT CORRELATION. *International Journal Of Theoretical & Applied Finance*, 12(7), 1007-1026.

Browning, E. S. (2011, February 2). Stocks Hit Post-Crisis High. *Wall Street Journal*. pp. A1-A2.

Bryan, D. (2012). Going forward: The perpetual crisis of finance. *Culture & Organization*, 18(2), 171-176.

Byun, K. J. (2010). The U.S. housing bubble and bust: impacts on employment. *Monthly Labor Review*, 133(12), 3-17.

Can financial ethics avert the next crash?. (2011). *FOW: The Global Derivatives Magazine*, (474), 7.

CAROW, K. A., KANE, E. J., & NARAYANAN, R. P. (2011). Safety-Net Losses from Abandoning Glass-Steagall Restrictions. *Journal Of Money, Credit & Banking (Wiley-Blackwell)*, 43(7), 1371-1398.

Chartered Financial Analyst Institute. (2010). *Code of ethics and standards of professional conduct*. 14(1).

CHENEY, G. (2011). FROM THE GREAT DEPRESSION TO THE 'GREAT RECESSION'. *Financial Executive*, 27(3), 19-20.

Cheng, J. (2011, February 9). Stock Recovery in High Gear. *Wall Street Journal - Eastern Edition*. pp. C1-C2.

Crawford, C. (2011). The Repeal Of The Glass- Steagall Act And The Current Financial Crisis. *Journal Of Business & Economics Research*, 9(1), 127-133.

Demers, E., Bhattacharya, N., & Joos, P. (2010). The Relevance of Accounting Information in a Stock Market Bubble: Evidence from Internet IPOs. *Journal Of Business Finance & Accounting*, 37(3/4), 291-321.

Dokko, J., Doyle, B. M., Kiley, M. T., Kim, J., Sherlund, S., Sim, J., & Van Den Heuvel, S. (2011). Monetary policy and the global housing bubble. *Economic Policy*, 26(66), 233-283.

Edward Xuejun, L., Ramesh, K. K., & Shen, M. (2011). The Role of Newswires in Screening and Disseminating Value-Relevant Information in Periodic SEC Reports. *Accounting Review*, 86(2), 669-701.

Eichengreen, B. (2012). When Currencies Collapse. *Foreign Affairs*, 91(1), 117-134.

Eichler, S., & Maltritz, D. (2011). Currency crises and the stock market: empirical evidence for another type of twin crisis. *Applied Economics*, 43(29), 4561-4587.

FAMA, E. F. (1970). EFFICIENT CAPITAL MARKETS: A REVIEW OF THEORY AND EMPIRICAL WORK. *Journal Of Finance*, 25(2), 383-417.

Farmer, R. A. (2012). The stock market crash of 2008 caused the Great Recession: Theory and evidence. *Journal Of Economic Dynamics & Control*, 36(5), 693-707.

Ferguson, R. (1989). On Crashes. *Financial Analysts Journal*, 45(2), 42.

FORBES, S. (2011). Two Dates Prez Should Take to Heart--But Won't. *Forbes*, 188(2), 11-12.

Glaum, M., & Friedrich, N. (2006). After the "Bubble": Valuation of Telecommunications Companies by Financial Analysts. *Journal Of International Financial Management & Accounting*, 17(2), 160-174.

Greenspan, A. & Kennedy, J. (2007). *Sources and Uses of Equity Extracted from Homes (Report No. 2007-20)*. Retrieved from the Federal Reserve Board.

Grosse, R. (2012). Bank regulation, governance and the crisis: a behavioral finance view. *Journal Of Financial Regulation & Compliance*, 20(1), 4-25.

HAMID, T. (2011). Markets take hit from US downgrade. MEED: Middle East Economic Digest, 55(32), 17.

Hartz, R. (2012). Reclaiming the truth of the market in times of crisis: Course, transformation and strategies of a liberal discourse in Germany. *Culture & Organization*, 18(2), 139-154.

Helberger, D. (2012). Why Do Investors Buy Structured Products? A Behavioral Finance Explanation. *Journal Of Wealth Management*, 14(4), 51-60.

JUNGQVIST, A. L., & WILHELM, J. J. (2003). IPO Pricing in the Dot-com Bubble. *Journal Of Finance*, 58(2), 723-752.

Lahart, J. (2008, May 16) Bernake's Bubble Laboratory. *The Wall Street Journal*. [Retrieved] 2012, March 18 ,[from] <http://online.wsj.com/article/SB121089412378097011.html>

- Levine, R. (2012). The Governance of Financial Regulation: Reform Lessons from the Recent Crisis. *International Review Of Finance*, 12(1), 39-56.
- LI, C., & XUE, H. (2009). A Bayesian's Bubble. *Journal Of Finance*, 64(6), 2665-2701.
- Meric, I., Prober, L. M., Gong, L., & Meric, G. (2011). Co-Movements of Global Stock Markets Before and After the 2008 Stock Market Crash. *International Research Journal Of Finance & Economics*, (74), 68-83.
- Morgan, M. (2012). ARE WE HEADED FOR A FALL?. *Strategic Finance*, 93(9), 43-48.
- Nazlıoğlu, B., Şendurur, U., Yanik, S., & Özerhan, Y. (2012). THE EFFECT OF OWNERSHIP STRUCTURE ON STOCK PRICES DURING CRISIS PERIODS: A STUDY ON ISE 100 INDEX. *International Journal Of Business & Social Science*, 3(6), 82-88.
- Neff, R. (1995). JAPAN'S MARKETS HAVEN'T STOPPED SHAKING. *Businessweek*, (3413), 102.
- Neff, R., & Holyoke, L. (1995). THE HOPE BENEATH THE RUBBLE IN JAPAN. *Businessweek*, (3409), 40.
- Nelan, B. W., & Desmond, E. W. (1995). Economic aftershock. *Time*, 145(5), 45.
- Nias, S. (2011). QE2 is 'welcome' despite risk of inflation. *Printweek*, 2.
- Petrova, I. (2009). DERIVATIVES AS THE WORLD FINANCIAL CRISIS FACTOR. *Journal Of Business Management*, (2), 75-84.
- Pericoli, M., & Taboga, M. (2012). Bond risk premia, macroeconomic fundamentals and the exchange rate. *International Review Of Economics & Finance*, 22(1), 42-65.
- Schaefer, S. (2012). Bernanke: Gold Standard A 'Waste Of Resources'. *Forbes.Com*, 10.
- Shiller, R. J. (2001). Exuberant Reporting. *Harvard International Review*, 23(1), 60.
- Stephens, W., Vance, C. A., & Pettegrew, L. S. (2012). Embracing Ethics And Morality. *CPA Journal*, 82(1), 16-21.
- Svetlova, E. (2012). Talking about the crisis: Performance of forecasting in financial markets. *Culture & Organization*, 18(2), 155-169.
- The economy and the stock market: views of financial executives. (1990). *Financial Executive*, 6(4), 48-49.
- The long demise of Glass-Steagall.* (2003). Retrieved March 19, 2012, from www.pbs.org/wgbh/pages/frontline/shows/wallstreet/weill/demise.html
- Yalamova, R., & McKelvey, B. (2011). Explaining What Leads Up to Stock Market Crashes: A Phase Transition Model and Scalability Dynamics. *Journal Of Behavioral Finance*, 12(3), 169-182.

APPENDIX A: CFA Code of Ethics and Standards of Professional Conduct

CODE OF ETHICS AND STANDARDS OF PROFESSIONAL CONDUCT



PREAMBLE

The CFA Institute Code of Ethics and Standards of Professional Conduct are fundamental to the values of CFA Institute and essential to achieving its mission to lead the investment profession globally by setting high standards of education, integrity, and professional excellence. High ethical standards are critical to maintaining the public's trust in financial markets and in the investment profession. Since their creation in the 1960s, the Code and Standards have promoted the integrity of CFA Institute members and served as a model for measuring the ethics of investment professionals globally, regardless of job function, cultural differences, or local laws and regulations. All CFA Institute members (including holders of the Chartered Financial Analyst® [CFA®] designation) and CFA candidates must abide by the Code and Standards and are encouraged to notify their employer of this responsibility. Violations may result in disciplinary sanctions by CFA Institute. Sanctions can include revocation of membership, revocation of candidacy in the CFA Program, and revocation of the right to use the CFA designation.

THE CODE OF ETHICS

Members of CFA Institute (including CFA charterholders) and candidates for the CFA designation ("Members and Candidates") must:

- Act with integrity, competence, diligence, respect, and in an ethical manner with the public, clients, prospective clients, employers, employees, colleagues in the investment profession, and other participants in the global capital markets.
- Place the integrity of the investment profession and the interests of clients above their own personal interests.
- Use reasonable care and exercise independent professional judgment when conducting investment analysis, making investment recommendations, taking investment actions, and engaging in other professional activities.
- Practice and encourage others to practice in a professional and ethical manner that will reflect credit on themselves and the profession.
- Promote the integrity of and uphold the rules governing capital markets.
- Maintain and improve their professional competence and strive to maintain and improve the competence of other investment professionals.

STANDARDS OF PROFESSIONAL CONDUCT

I. PROFESSIONALISM

A. Knowledge of the Law. Members and Candidates must understand and comply with all applicable laws, rules, and regulations (including the CFA Institute Code of Ethics and Standards of Professional Conduct) of any government, regulatory organization, licensing agency, or professional association governing their professional activities. In the event of conflict, Members and Candidates must comply with the more strict law, rule, or regulation. Members and Candidates must not knowingly participate or assist in and must dissociate from any violation of such laws, rules, or regulations.

B. Independence and Objectivity. Members and Candidates must use reasonable care and judgment to achieve and maintain independence and objectivity in their professional activities. Members and Candidates must not offer, solicit, or accept any gift, benefit, compensation, or consideration that reasonably could be expected to compromise their own or another's independence and objectivity.

C. Misrepresentation. Members and Candidates must not knowingly make any misrepresentations relating to investment analysis, recommendations, actions, or other professional activities.

D. Misconduct. Members and Candidates must not engage in any professional conduct involving dishonesty, fraud, or deceit or commit any act that reflects adversely on their professional reputation, integrity, or competence.

II. INTEGRITY OF CAPITAL MARKETS

A. Material Nonpublic Information. Members and Candidates who possess material nonpublic information that could affect the value of an investment must not act or cause others to act on the information.

B. Market Manipulation. Members and Candidates must not engage in practices that distort prices or artificially inflate trading volume with the intent to mislead market participants.

III. DUTIES TO CLIENTS

A. Loyalty, Prudence, and Care. Members and Candidates have a duty of loyalty to their clients and must act with reasonable care and exercise prudent judgment. Members and Candidates must act for the benefit of their clients and place their clients' interests before their employer's or their own interests.

B. Fair Dealing. Members and Candidates must deal fairly and objectively with all clients when providing investment analysis, making investment recommendations, taking investment action, or engaging in other professional activities.

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C. Suitability.

1. When Members and Candidates are in an advisory relationship with a client, they must:
 - a. Make a reasonable inquiry into a client's or prospective client's investment experience, risk and return objectives, and financial constraints prior to making any investment recommendation or taking investment action and must reassess and update this information regularly.
 - b. Determine that an investment is suitable to the client's financial situation and consistent with the client's written objectives, mandates, and constraints before making an investment recommendation or taking investment action.
 - c. Judge the suitability of investments in the context of the client's total portfolio.
2. When Members and Candidates are responsible for managing a portfolio to a specific mandate, strategy, or style, they must make only investment recommendations or take only investment actions that are consistent with the stated objectives and constraints of the portfolio.

- D. Performance Presentation.** When communicating investment performance information, Members and Candidates must make reasonable efforts to ensure that it is fair, accurate, and complete.

- E. Preservation of Confidentiality.** Members and Candidates must keep information about current, former, and prospective clients confidential unless:
1. The information concerns illegal activities on the part of the client or prospective client,
 2. Disclosure is required by law, or
 3. The client or prospective client permits disclosure of the information.

IV. DUTIES TO EMPLOYERS

- A. Loyalty.** In matters related to their employment, Members and Candidates must act for the benefit of their employer and not deprive their employer of the advantage of their skills and abilities, divulge confidential information, or otherwise cause harm to their employer.
- B. Additional Compensation Arrangements.** Members and Candidates must not accept gifts, benefits, compensation, or consideration that competes with or might reasonably be expected to create a conflict of interest with their employer's interest unless they obtain written consent from all parties involved.
- C. Responsibilities of Supervisors.** Members and Candidates must make reasonable efforts to detect and prevent violations of applicable laws, rules, regulations, and the Code and Standards by anyone subject to their supervision or authority.

V. INVESTMENT ANALYSIS, RECOMMENDATIONS, AND ACTIONS

- A. Diligence and Reasonable Basis.** Members and Candidates must:
1. Exercise diligence, independence, and thoroughness in analyzing investments, making investment recommendations, and taking investment actions.

2. Have a reasonable and adequate basis, supported by appropriate research and investigation, for any investment analysis, recommendation, or action.

B. Communication with Clients and Prospective Clients.

Members and Candidates must:

1. Disclose to clients and prospective clients the basic format and general principles of the investment processes they use to analyze investments, select securities, and construct portfolios and must promptly disclose any changes that might materially affect those processes.
2. Use reasonable judgment in identifying which factors are important to their investment analyses, recommendations, or actions and include those factors in communications with clients and prospective clients.
3. Distinguish between fact and opinion in the presentation of investment analysis and recommendations.

- C. Record Retention.** Members and Candidates must develop and maintain appropriate records to support their investment analyses, recommendations, actions, and other investment-related communications with clients and prospective clients.

VI. CONFLICTS OF INTEREST

- A. Disclosure of Conflicts.** Members and Candidates must make full and fair disclosure of all matters that could reasonably be expected to impair their independence and objectivity or interfere with respective duties to their clients, prospective clients, and employer. Members and Candidates must ensure that such disclosures are prominent, are delivered in plain language, and communicate the relevant information effectively.
- B. Priority of Transactions.** Investment transactions for clients and employers must have priority over investment transactions in which a Member or Candidate is the beneficial owner.
- C. Referral Fees.** Members and Candidates must disclose to their employer, clients, and prospective clients, as appropriate, any compensation, consideration, or benefit received from or paid to others for the recommendation of products or services.

VII. RESPONSIBILITIES AS A CFA INSTITUTE MEMBER OR CFA CANDIDATE

- A. Conduct as Members and Candidates in the CFA Program.** Members and Candidates must not engage in any conduct that compromises the reputation or integrity of CFA Institute or the CFA designation or the integrity, validity, or security of the CFA examinations.
- B. Reference to CFA Institute, the CFA Designation, and the CFA Program.** When referring to CFA Institute, CFA Institute membership, the CFA designation, or candidacy in the CFA Program, Members and Candidates must not misrepresent or exaggerate the meaning or implications of membership in CFA Institute, holding the CFA designation, or candidacy in the CFA program.

SMEs Default Prediction Model: An Analysis of the Existing Literature

Seyed Amir E. Khorasgani⁷

Abstract

The ability to accurately and consistently predict small firms' default would be beneficial for both lending banks and firms and hence could help to build a more stable and prosperous economy. In this study we use more than 30,000 UK small and medium sized enterprises (SMEs) covering the period from 2000 to 2009 and from 22 manufacturing industries to analyse the existing accounting-based default prediction model for UK SMEs. We tested the prominent SMEs logistic default prediction model to establish their reliability and prediction power for UK sample. The evaluation of the SMEs model has been carried out by comparing its accuracy in predicting default events with Ohlson model's which is mainly developed for large firms. Moreover, different sample tests revealed that SMEs' credit risk behaviour is idiosyncratic and it is crucial to build the default prediction models specifically for these firms to gain the most accurate and reliable outcome. This study also sheds light on the effect of economic cycles on SMEs default prediction accuracy. Finally, our results ascertain that controlling for industry and

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ownership structure significantly enhances the accuracy of the default prediction model for UK SMEs.

Introduction

According to previous studies such as Smyrnios and Romano (1994), Michaels et al., (1999) and Matlay and Westhead (2007), SMEs encompass the vast proportion of global economy and economy's growth factors such as innovation, productivity and employment are significantly affected by SMEs financial situation. According to Small Business Statistics⁸, in 2012 SMEs account for 99.9 percent of all private sector businesses in the UK, 59.1 per cent of private sector employment and 48.8 per cent of private sector turnover. SMEs also play an important role in improving the political and socio-economical infrastructure of both developed and developing countries.

As a matter of fact, SMEs are normally riskier than their larger counterparts but considering the number of SMEs in the economy, allocating the necessary credit to these firms would benefit both banks and small businesses consequently. In the aftermath of the recent financial crisis, the access SMEs to finance becomes tougher than the past. In other words, the crisis urges many smaller banks to restrict the credit which was granted to the SMEs before the recession. It is mainly because the banks usually apply the same method to predict SMEs default event as it is being used for listed companies. In most cases, these methods overestimate the riskiness of the small firms and subsequently calculate higher level of capital requirements which might lead to rejection of SMEs loan requests. Thus, developing an elaborate and accurate default prediction model particularly for SMEs would ease the process of crediting for small firms and bring more benefits to the banks consequently. However, most of the research in this field have used the

⁸ <http://www.fsb.org.uk/stats>

large listed firms as a sample of the study and ignored SMEs by and large. As these firms are different in many aspects from their larger counterparts and exhibits different behaviour in terms of financing policies, this study aims to enrich the theme of SMEs default prediction by improving the existing model, including the complementary factors and testing the model accuracy in different samples.

Another reason that certifies the necessity of exclusive models for SMEs default prediction lies in the new Basel Accord regulations. Basel regulation obliges the banks to generate their own internal procedure to assess the firms for credit allocation. These regulations require the banks to establish their own rating system and obtain the most effective formula to estimate the unexpected loss and capital requirement for which the Probability of Default (PD) is the main input. The development of efficient default prediction model, apart from being useful for the lenders and business investors, can give the policy makers valuable insights about the main reasons behind SMEs default event and the solutions to be taken to avoid it.

As UK is an economy which contains the tremendous number of SMEs and also due to the availability of relevant data, this study aims to probe the theme of SMEs default prediction for UK sample. The analysis will be carried out by evaluating the existing SMEs accounting-based default prediction model introduced by Altman and Sabato (2007) and Altman et al. (2010) and improve it by considering different factors which can be important indicators of SMEs default. The process of evaluation will be done by considering the accuracy and prediction power of the model in several steps. First, the necessity of having the specific SMEs default prediction model will be tested by comparing the effectiveness of SMEs default prediction model and the Ohlson's (1980) model which is originally developed for listed firm. In the next step, the SMEs model will

be tested for large firm sample to investigate whether it shows the same level of accuracy. Finally, the SMEs default prediction model will be tested for before and after the recent UK economy recession to test the possible effect of economic cycles on SMEs default prediction accuracy. Furthermore, this study also aims to find the possible effects of different industries and ownership forms on SMEs default prediction model. If those factors are proven to have important effects on predicting the firm's default, their inclusion would improve the accuracy and reliability of the model.

The paper proceeds as follows. The next section is review of the accounting-based default prediction literature for both listed companies and SMEs. The sample selections and variables estimations procedure for both models along with the research methodology are presented in section 3. Research findings and analyses of the results are reported in section 4. Summary, conclusion and limitations of the study constitute section 5 of the paper.

Literature Review

Accounting-based Models Foundation

Beaver (1967) was one of the first major credit risk research in which a univariate analysis has been used to predict defaulted and non-defaulted firms. Altman (1968) used the Multivariate Discriminant Analysis (MDA) method to remove the inconsistency problems of Beaver (1967) model. He concluded that traditional ratio analysis is no longer a reliable approach and it should

be replaced by MDA which is more sophisticated for predicting default events. Altman (1968) research findings led to noticeable success in terms of accuracy and became highly applied by the subsequent research as Z score model. Altman chose 66 companies, 33 failed and 33 non-failed which had a bankruptcy petition in the specific period. To obtain the best results, Altman at first picked all the possible financial ratios which could be considered as predictive indicators of firm's default. In the next step, he classified all the default indicators into five standard categories: activity, solvency, leverage, liquidity and profitability. Finally, the 5 most predictive ratios were selected out of 5 main categories based on their prediction power.

Following Altman (1968), a vast number of studies used the MDA statistical method to predict the firm's default such as Blum (1974), Altman et al. (1977), Micha (1984), Lussier (1995) and Altman et al. (1995). However, more recent studies found some critical problems related to MDA method which lay doubts on the efficiency of the model. For instance, Karles and Prakash (1987) argued that the two major assumptions of the MDA are being severely violated through the research: 1) the independent variables of the model should be multivariate which are normally distributed. 2) variance-covariance matrices or the group dispersion matrices are equivalent across the non-failing and failing group. Karles and Prakash (1987) concluded that only if the normality conditions are met in MDA model, the results obtained are reliable and the Multiple Discriminant Analysis method is optimal.

Ohlson's (1980) research was one of the first corporate failure studies which challenged the Altman's (1968) Z-score by introducing the probabilistic model for predicting the firm's failure (O-score). The study aimed to mitigate the problems of previous models by using the logistic statistical method instead of MDA. Ohlson (1980) selected 2000 non-failed along with 105 failed

firms from 1970 to 1976 which had at least 3 years trade background in US stock exchange. In order to generate the default prediction model, the study employed 9 explanatory variables while no theoretical justifications were discussed regarding the selection procedure.

Three different models were employed in Ohlson's (1980) research. The first model was to predict default within one year. The second one was to predict default within two years and the last one was to predict default in one or two years. Subsequently, for estimating the probability of firm's default, he used the logistic regression in all three models. Ohlson (1980) pointed out that the previous studies overestimated the predictive accuracy of the existed default models. Furthermore, he asserted that the predictive powers of the default models enormously relies on the choice of cut-off points and also the importance of each type of errors (Type I and Type II) for specific users. The study also concluded that the time in which the information is available highly affects the predictive power of the specific model. Finally, Ohlson (1980) suggested that selecting a larger sample and also adding more default indicators increases the predictive power of the model significantly.

UK Accounting-based Default Prediction Model

Taffler's (1983) Z-score model was one of the first and most important default prediction models for UK firms. He used discriminant analysis approach to predict the corporate bankruptcy in the UK sample by using the financial ratios within a multivariate framework. "The discriminant analysis aims at distinguishing between two or more distinct populations on the basis of certain of the characteristics of their members and the classification of further individuals as belonging to one of the populations more than to any of the others. The two group situation is appropriate,

with failed and solvent firms constituting the data samples from which the discriminant model is derived, and with the variables consisting of financial ratios derived from conventional profit and loss accounts and balance sheets”. (Taffler 1983, pp. 296)

The main predictive variables describing the firm’s financial situation in the model are profitability, financial risk, working capital position, liquidity, asset turnover, value added contribution and creditor position. Taffler (1983) research pointed out that Z-score by itself can not be used as criterion to compare the firms’ performance with other firms and also with themselves based on the previous records. Thus, Apart from modelling the Z-score for UK firms, Taffler (1983) study converted the Z-score into a ratio measure along a scale 0-100 to compare the performance of the firms based on their Z-score. A company’s PAS (performance analysis score) in a particular year is obtained by ranking the Z-scores of all firms for that year in ascending order and observing the percentile in which the Z-score of the concern of interest lies.

Charalambakis and Espenlaub (2009) investigated whether the Taffler Z-score conveys enough information regarding the probability of financial distress for UK firms. The study used the hazard model which includes the Z-score components and concluded that half of its component ratios do not contribute to the corporate failure prediction. They also developed another hazard model that includes Z-score as the only predictor of bankruptcy and compared both models with two hazard models based on Shumway (2001). The first Shumway model is including accounting and market based variables while the second one consists of only market driven variables. Charalambakis and Espenlaub (2009) indicated that both Shumway models are significantly more informative of financial distress than the Z-score models. The out of sample prediction tests ascertain that the Z-score models show very low predictive power in compared with the

Shumway model which combines accounting and market variables. The study concluded that Z-score model is not a powerful predictor of firm's default event and should be treated cautiously with respect to the prediction of financial distress.

The logistic default prediction model for UK sample was first applied by Charitou et al., (2004) using data from 1988-97. Prior to Charitou et al., (2004), most of the UK failure prediction models employed multiple discriminant analysis (MDA) method to predict the default event. The study challenged the restrictive statistical requirements of MDA models and proved that logistic regression are more accurate and reliable models for predicting firm's default. Moreover, Charitou et al, (2004) research was one of the first studies that examine the effects of operating cash flow information in explaining UK firms' financial distress. The results of the study indicate that the model including three financial variables, a profitability, financial leverage and cash flow variables, yielded an overall correct classification accuracy of 83% one year prior to the failure.

SMEs Financial Failure Forecast Model

Pederzoli and Torricelli (2010) studied the SMEs default prediction model for specific regions in Italy and found out that the logistic model with four explanatory variables is the most efficient model for Italian SMEs sample. They carried out some performance measure tests such as associate Accuracy Ratio (AR) and Cumulative Accuracy Profile (CAP) to examine the ability of the model in predicting the non-defaulted and defaulted firms. The accuracy tests illustrate that the level of accuracy of the models to some extent depends on choosing the appropriate cut-off value. The higher cut-off value clearly brings about the higher type I error and cause the

reduction in type II error subsequently. On the other hand, it was found out by their research that by fixing the cut off value at sample's level, the average prediction error rate would be lowest. The results of their study also indicated that parsimonious model with only four predictors are sufficient to predict the firms' default effectively.

Sohn and Kim (2006) developed the random effects logistic regression model to predict the default events for Korean SMEs. The random effect model has the advantage of taking into account the uncertainty that is not possible to be explained by individual factors along with the individual characteristics of each SMEs. The results of the study indicated that the random effects logistic regression model in terms of classification accuracy is more efficient than the other alternatives such as fixed effect and pooled logistic regression models.

Lugovskaya (2009) investigated the suitability and efficiency of statistical models in predicting the default events for Russian SMEs. The statistical model applied in the study was mostly based on the predictive financial ratios used in previous studies while size and age variables were also added into the model. Lugovskaya (2009) asserted that it is important to distinguish between types I and type II errors before estimating the accuracy of the model. It was also mentioned that as the type I error is more critical than type II for lenders; it is more efficient to aim for the lower type I error at the time of selecting the cut-off ratio. The study concluded that although there are a lot of drawbacks in using the accounting based models for default prediction; the financial ratios derived from balance sheet and profit loss account are good predictors of firm's default for Russian SMEs. Finally, Liquidity and Activity are indicated as the most crucial indicators of default for Russian SMEs.

Altman and Sabato's (2007) default prediction model can be named as one of the most prominent models which were generated specifically for SMEs. The study developed a distress prediction model specifically for the SMEs sector to analyse its effectiveness compared to a generic corporate model. The sample of the study contains 2000 US firms (with sales less than \$65 million) over the period 1994 to 2002. In order to create the default prediction model, the study employed 17 financial ratios that were most successful in predicting firm's default and compatible with SMEs. It was concluded that developing a specific model for SMEs will increase the default prediction accuracy and lower bank capital requirements for these firms.

The Altman and Sabato's (2007) SMEs default prediction model was expanded in Altman et al. (2010) study in which the possible effects of qualitative data on default prediction accuracy was also investigated. It is one of the very few studies which applied the SMEs default prediction model for the UK sample. Altman et al., (2010) generally attempted to combine the financial indicators of SMEs default with non-financial information to predict the default events. It advantaged from the vast, elaborate sample which consists of 5.8 million sets of unlisted firms' accounts. The sample includes over 66000 failed firms during the period 2000 to 2007. In order to create the model, the study used the accounting ratios from the previous relevant research such as Taffler (1984), Ohlson (1980), Ming and Watts (1996) and Hillegeist et al. (2004) which are believed to be valid default indicators for UK SMEs. The study also shed light on the important effects of working capital and trade credit variables on the survival of the small firms. The literature on trade credit suggests that at the time of financial distress, SMEs usually take extended credit from suppliers and extend more credit to customers. It forms a large proportion of a small firm's liabilities. The study also found out that the complementary non-financial data such as company filing histories, legal action by creditors to recover unpaid debts,

comprehensive audit report and firm specific characteristics enhance the SMEs default prediction power significantly. As a matter of fact, the qualitative data is doubly important in case of SMEs as the financial information is oftentimes quite limited for small firms. Moreover, as the non-financial data used in Altman et al., (2010) can be updated regularly, financial institutions are able to change their credit decisions in timely manner. However, although this study gives a valuable insight regarding the importance of qualitative data in predicting the firm's default event, this method can not be implemented easily for all the SMEs model as the relevant data is not always available.

Default Prediction and Economic Cycles Analysis

According to Richardson et al., (1998), accounting-based statistical models do not appear to perform significantly better than do trained judges (loan officers) in terms of predicting corporate failure. One reason that might account for the weak showing of accounting-based statistical models in such comparisons is that most models do not control for the information changes which occur as a result of economic crisis.

At the starting point of economic cycle, lenders perceive the default risk to be low. They grant loans even to the borrowers with low credit background and receive small risk premiums. Thus, at the time of financial distress, some borrowers incur more amount of debt than they are able to support and they eventually default on their obligations. It also causes lenders to turn more conservative in their credit extension policies. As the situation becomes difficult for borrowers to borrow, some borrowers would not be able to refinance their maturing debts and thereby fail to meet their obligations. Finally, as the default waves settle, lenders restore their confidence and the new cycle starts. According to the research implemented by QFINANCE, different default prediction models have different attitudes towards economic cycles. The accounting-based

approach which calculate the firm's probability of default as a function of several accounting variables, are more susceptible to economic condition and might go substantially wrong in severe economic downfalls. The main limitation of these models is that they don't capture the effect of yearly default rate variation which is caused by different economic and credit market conditions. Thus, when the predictor indicates the default rate higher than the rates forecasted by accounting-based models, a possible explanation is that the model doesn't account for distressed situation.

Pompe and Bilderbeek (2005) used large amounts of data from Belgian small firms to examine the effects of economic downturn on accounting-based default prediction model. The study found that recession and a rapid increase in the number of bankruptcies, accompanied the deterioration in the model's performance. It is also pointed out that the decline in the model's performance is mainly caused by a worsening predictability of failure and not by changing the fitness of the model.

Data & Methodology

Sample of the Study

The sample of the study was selected from FAME database which is widely used in many relevant SMEs research. FAME has been approved to be an appropriate database representing small firms' financial information. According to Bureau van Dijk, FAME is the most comprehensive database of UK companies which includes all necessary information regarding UK SMEs. This information contains the elaborate financial data from the SMEs profit loss

accounts and balance sheets such as assets and liabilities, earnings, working capital, bank deposit and etc. Moreover, it includes the necessary non-financial data such as ownership structure and company status which is essential to carry out this research.

The dataset for this study contains data for more than 30000 UK SMEs over the period 2000 to 2008 while financial year 2009 was retained to be used as a hold-out sample for testing the accuracy of the model. The definition of SMEs follows the Basel definition which specifies the companies with sales less than €50 million (£42 million) as small businesses. It is worth mentioning that the dataset is unbalanced and the number of firms changes every year due to some events such as bankruptcy, merge & acquisition and etc. Moreover, data is collected from Balance Sheets and Profit Loss accounts of 15 to 36 Primary UK SIC 2003 codes which encompass UK manufacturing industries. The other complementary non-financial information would be obtained from the Header Sheets which are also available in FAME database package.

The main logic behind using the manufacturing sector to be investigated in this research is related to the nature of these industries. The UK manufacturing industries are more homogenous in terms of firms' financial behaviour and are involved in the same economical environment. Therefore, the results of the research can easily be attributed to all the firms in the industry.

In order to account for the time and environmental characteristics of the data and also to investigate the possible effect of different industries on default prediction accuracy and reliability, the empirical model of the study includes time and industry factors. The time factors are added to the model by including the time dummies for 8 years to control for the possible effects of time on SMEs defaults prediction behaviour. Industry effects also will be examined by

adding the 21 industry dummies for all UK Manufacturing Industries (15-36 SIC Codes)⁹. Moreover, as this study aimed to account for the possible effects of ownership structure on SMEs default prediction, four structural dummies (ownership structure) are included in the model considering the Legal Form information available in the FAME database. The four structural dummies selected to control for SMEs ownership effects are Private, Public, Unlimited and Other¹⁰.

Finally, the data in the sample was collected for 9 years and considering the inflation during this period, all the financial information in the dataset had needed to be deflated before being used in the regression analysis. The deflating process was done by using the Producer Price Index (PPI) as a deflator for each year and for different SIC codes.

Testing Strategy

In order to fulfil the objectives of the research, two different hold-out samples were created in this study. The first hold-out sample which is built to test the accuracy of the models contains the information from 2008 and 2009 financial year and for Manufacturing SMEs (15 to 36 Primary UK SIC 2003 codes). To create the most appropriate hold-out sample for accuracy test, first the possible number of defaulted firms should be randomly collected from population. In the next step, non-defaulted firms are being collected on the basis of keeping the default rate at average default rate of the sample which is 6.8%. Finally, the model would be run for 2008 sample and tested whether it predicts the default correctly for 2009 or not.

⁹ One dummy was dropped to avoid multicollinearity problem.

¹⁰ It constitutes the different legal form of the UK SMEs.

Due to the availability of the company status in FAME database, data for defaulted and non-defaulted firms can be collected easily. However, according to Altman et al. (2010), in order to exclude the possible outliers from the sample and avoiding biases, it is important to separate the case of closure from failure. In this study, the firms signed as Active between 2000 and 2009 are considered non-defaulted and the firms signed as In Liquidation, In Administration, In Receivership are considered defaulted for the same period. The applied criteria in selecting the defaulted and non-defaulted firms in this research were widely used in the previous literature.

Testing the hypothesis which shows the necessity of having an elaborate unique credit risk model particularly for small firms is one of the major goals of this study. The second hold-out sample was generated to implement the test by employing the data from 2009 financial year and particularly for large firms¹¹. In the second hold-out sample defaulted firms constitutes the 6%¹² of the sample which is the average default rate of the large firms' sample.

This study also aims to investigate the possible effect of economic cycles on UK SMEs default prediction model. In order to achieve this objective, the sample of the study will be divided into 2 sub-samples: before the recession¹³ and the recession time. For each sub-sample, the default prediction model will be developed separately. Finally, the 2009 Hold-out sample will be used to test the accuracy of the three models (pre recession, recession and whole sample) and compare the results.

¹¹ The large firms are defined as firms with turnover over 40 million pounds.

¹² <http://www.ft.com/cms/s/0/7880670e-d51f-11dc-9af1-0000779fd2ac.html#axzz20A3D1Zhn>

¹³ It is assumed that UK recession started at 2007.

UK SMEs Default Prediction Model

Altman and Sabato (2007) used 5 financial categories: Activity, Liquidity, Leverage, Coverage and Profitability as basis to select the default prediction variables. The study chose 17 financial ratios which are believed to be predictive indicators of SMEs default event. After testing the accuracy of each indicator, 5 most predictive financial ratios were selected as below:

Profitability = Retain Earnings / Total Assets

Activity = EBITDA/Total Assets

Liquidity = Cash / Total Assets

Coverage = EBITDA / Interest Expenses

Leverage = Short-term Debt / Equity Book Value

Altman et al. (2010) extended the previous model by adding more accounting variables which were compatible with UK sample.

Capital employed / Total liabilities

Quick assets / Current assets

Current assets / Current liabilities

Total liabilities / Quick assets

Trade Creditors/Total Liabilities

Trade Debtors/Total Assets

Net cash/Net worth

Short-term debt/Net Worth

The main SMEs model in this study was derived from the accounting ratios used in Altman and Sabato (2007) and Altman et al. (2010). However, this study tests all the variables in the model by using the forward stepwise selection procedure to choose the best indicators of default for UK SMEs sample. Moreover, it only analyses the default prediction model including the quantitative indicators and therefore the qualitative indicators of default will not be examined in this research.

The components of the variables were collected directly from the FAME database while in some cases the relevant proxies were obtained by implementing the calculation and replacements.

In case of dependent variable, considering the SMEs default event, predictive characteristics of the model and also in order to have a positive intercept and slopes; KPG (probability of being good) is used to represent the likelihood of default for SMEs. In contrary to PD (probability of default), in KPG the higher the final logit score, the lower the likelihood of the firm will be defaulted. The dependent variable in this study also is a probability of being good (KPG) which is signified by using the binary indicator (0= defaulted, 1= non-defaulted). In order to create the KPG variable in the sample, all the firms with company status as “Active” are given the score 1 while the firms with company status as “In Liquidation”, “Administration” and “Receivership” are given 0 respectively.

Moreover, Altman and Sabato (2007) suggested that the logarithmic transformation of the variables would decrease the range of values by each variable. It also would compensate the lack of accuracy caused by excluding the qualitative data in the study. In addition, logarithm transformation makes the variables distribution closer to normal and mitigates the negative effect of outliers on estimation results. Hence, in this study the logarithm transformation of all 5 explanatory variables were used in the regression process.

UK SMEs Default Prediction Model: Model Compatibility Test

In order to test the credibility of exclusive SMEs default prediction model for UK sample, the study compares the results of Altman et al. (2010) SMEs model and the Ohlson's (1980) model which is originally developed for listed firm. As Ohlson's (1980) model is a logistic model and

widely being used to predict the default events for listed firms, the comparison between these models can give a valuable insight regarding the necessity of having a specific default prediction model for UK SMEs. If both models show some sort of similar accuracy, it indicates that it is not necessary to have one specific model only for SMEs. On the other hand, if the SMEs adjusted model shows the higher level of accuracy compared with its counter model, it can somehow prove that there must be some particular default prediction model for SMEs to reach the most credible and accurate outcome.

Altman et al. (2010) Model

The coefficients of the model were obtained through running pooled and Random Effects Logistic regression and the results were compared precisely. Although the results of the random effect regression specifically in terms of coefficient signs were compatible with the literature, the pooled regression results indicate the higher level of significances for the explanatory variables in the model. Since the relevant research such as Altman et al. (2010) also employed the pooled logistic regression for the default analysis, this method was selected to be used in this study. However, as the data for this study was collected from 9 years of financial statements, the presence of time effects in the sample is highly predictable. Thus, to control for the possible time effects on the regression results, 8 time dummies for each year of observation are added to the model¹⁴.

The time dummy variables used in the model are highly significant which approves the necessity of including the time factor in the model. By comparing the results of the regressions with and

¹⁴ One dummy was dropped to avoid the problem of multicollinearity.

without the time dummies, it is also easy to conclude that controlling for time effects increase the accuracy and reliability of the pooled regression model to some certain level.

Insert Table 1

The only discrepancy that can be observed in Table 1 results is related to Leverage and Current Ratio variables. According to the previous studies such as Altman and Sabato (2007), SMEs Leverage and Current Ratio have meaningful and negative relationship with default probability. In the Table1, the coefficients of Leverage and Current Ratio are very close to zero and are not significant. The reason is most probably related to the inclusion of some leverage type variables in the model which are very similar functionally and can neutralise the effects of each other on default prediction. For instance, Capital Employed variable is shareholders fund plus long term liabilities divided by long term liabilities and it represents the book value of the capital structure of the company. Other leverage type variables in the model are Total Liabilities/Quick Assets, Trade Debtors/Total Assets and Trade Creditors/Total Liabilities. Trade creditor is a supplier who gives customers a grace period to pay bills after supplies have been delivered. Trade debtors on the other hand are customers of a firm who has not yet paid for goods and services delivered. The grace period varies from weeks for consumer goods to years for some capital goods. Trade credit variables are very important in case of SMEs as small firms usually depend on trade finance from suppliers when bank finance is not accessible. In addition, sometimes SMEs extend trade credit to customers in order to apply the policy of gaining and retaining customers. Thus, this was highly predictable that Trade Credit factors have a marked impact on SMEs default

prediction and the results of this study also proved that claim. Finally, Short-term Debt/ Net Worth is another Leverage type variable which accounts for the effects of current liabilities on default probability.

All other variables are consistent with previous studies in terms of significance level and signs. The level of significance is quite promising in this model as apart from two insignificant variables almost all the other variables are significant at 1% level. The Wald and log likelihood tests for this logistic model is statistically significant which indicates the strong relationship between the selected predictors and the default event. In addition, chi-square test is also significant and confirms the reliability of the model as a whole.

Application of Ohlson's Model in UK SMEs Sample

Model Variables

Ohlson (1980) selected the default prediction variables based on how frequent they are being used in the literature. In order to generate the model, Ohlson used 9 variables which have shown the highest level of accuracy in predicting the firms' default. The explanatory variables applied in Ohlson's model are as below:

FFO/TL = Pre-tax income plus depreciation and amortization divided by total liabilities.

WC/TA = Working capital divided by total assets.

TL/TA = Total liabilities divided by total assets.

CL/CA = Current liabilities divided by current assets.

OENEG = an indicator variable equal to one if owners' equity is negative, and zero otherwise. (1 if total liabilities exceed total assets, 0 otherwise)

Size = The ln (Total Assets/GDP price level index).

INTWO = An indicator variable equal to one if cumulative net income over the previous two years is negative, and zero otherwise.

NI/TA = Net income divided by total assets.

CHIN = $(NI_t - NI_{t-1}) / (|NI_t| + |NI_{t-1}|)$ is the scaled change in net income.

The original Ohlson's (1980) procedures were used in this study to create the Ohlson' model variables. To obtain the indicators of UK SMEs default, some variables such as Working Capital, Sales, Current Liability and total Assets were collected directly from the FAME dataset while for the others, the proxies are attained through calculations or replacements.

The logistic dependent variable of Ohlson (1980) model is the reverse of the one used in the main SMEs model as it represents the Probability of Default (PD) instead of Probability of Being Good (KPG). It means that the higher the final logit score, the higher the likelihood of the firm will be defaulted.

This study also uses the original Ohlson's dependant variable for the regression analysis in which all the firms in the sample with company status as "In Liquidation", "Administration" and "Receivership" take the value of 1 while all the firms with company status as "Active" take 0 respectively.

Ohlson's Model Logistic Regression Results

The pooled and random effect logistic regressions are used in Ohlson's model to find the most efficient statistical method for the UK SMEs sample. However, the close comparison of the results of both methods gave more credits to the pooled logistic regression. As it was mentioned before, in order to control for the possible effect of time on SMEs default prediction, 8 time dummies were included in the model.

Insert Table 2

The results of pooled logistic regression for Ohlson's model are more or less consistent with the original model in terms of sign and significance level. According to Table 2, except for FFOTL, CLCA and NITA which are not statistically significant, all the other explanatory variables are highly significant at 1% level while WCTA is significant at 10% level. Moreover, all the coefficient signs except for OENEG are compatible with the original model. OENEG is a dummy variable which depends on the owner's equity. It means that OENEG gets the value of one when Total Liabilities exceeds Total Assets and 0 otherwise. Thus, the positive relationship between OENEG and PD is understandable as the bigger difference between liabilities and assets in SMEs leads to the more possibility of default by making these firms more financially susceptible.

The results of the regression for Ohlson's model also confirm the important effect of time factors on the UK SMEs default prediction as all the time dummies in the model are significant at 1% level. Nevertheless, the results for the main variables in the model stay more or less the same in terms of significance and coefficient signs. The only difference is related to WCTA for which the level of significance changes from 10% to 5% after including the time dummies in the model. Finally, the log likelihood and chi square of the model is statistically significant which sheds light on the reliability of the model as a whole.

Accuracy Comparisons of the Models

As it was explained before, the accuracy comparison between SMEs adjusted model and large firms model (Ohlson) can approve or disapprove the importance of using an exclusive model for SMEs default prediction. The accuracy test has been done by selecting 2009 financial year as hold-out sample. In order to create the hold-out sample, first the number of 50 existed defaulted firms was collected from 2008. In the next step, the random selection is carried out to select 950 Active firms out of 5000 UK SMEs in 2008 to keep the default rate of the sample for UK SMEs (6.8%).

In order to obtain the default prediction accuracy of the models, it is essential to determine the appropriate cut-off ratios to estimate the type I¹⁵ and type II¹⁶ errors of prediction. In the case of errors, it is also recommended by some studies that one type of error can be set arbitrarily. The choice of how to do so could be determined by some kind of loss function specifying the costs of predicting default and predicting non-default incorrectly. However, this study focuses on two types of error simultaneously to determine the accuracy ratio of the models. It is worth mentioning that in the process of determining the cut-off ratio for both models, the first priority is to minimize the type I error which is more crucial than the type II error for lenders

In order to examine the prediction accuracy of the models, the relevant explanatory variables are set for each firm in 2008 hold-out sample and the regression coefficients of both SMEs and Ohlson's models are used to estimate KPG and PD. Subsequently, the defaulted and non-defaulted firms in the hold-out sample were predicted for 2009 based on the specific cut-off ratios. The cut-off ratio for Ohlson's model is selected at 6% level which is the default rate of the

¹⁵ A *type I error*, also known as a *false positive*, occurs when a [statistical test](#) rejects a true [null hypothesis](#) in this case firm is defaulted.

¹⁶ A *type II error*, also known as a *false negative*, occurs when the test fails to reject a false [null hypothesis](#) in this case firm is non-defaulted.

sample. In SMEs' model, 6% of the firms with the lowest level of KPG are predicted as defaulted firms. Thus, the Non-defaulted firms for Ohlson's model are the ones with PD less than 6% and Defaulted firms are the ones with any PD more than this level. Finally, type I and type II errors of the prediction for each model are estimated based on the company status of the firms in 2009¹⁷ to calculate the accuracy of the prediction.

The results of the tests acknowledge the efficiency of SMEs' model over Ohlson's model by showing the lower level of both type I and type II errors of prediction. The results indicate that SMEs' model type II and type I error rates are 21% and 12% respectively. The type II error rate for Ohlson's model is 36% and its type I error rate stands at 20%. According to Altman and Sabato (2007), one minus the average of each model's type I and type II error will indicate the accuracy ratio of the model which is 83.5% for SMEs' model and 72% for Ohlson's model. It is important to point out that by changing the cut-off ratio for each model, the level of type I and type II errors would change accordingly.

This result gives approval to our assumption that specific model particularly developed for SMEs is essential for predicting the small firms default events and leads to higher level of accuracy. It can be inferred that while some default indicators such as EBITDA, Liabilities and Assets related variables are crucial indicators of default, some SMEs specific variables such as Trade Debtor and Creditors can be very predictive indicators of small firms default event specifically. Thus, the inclusion of those variables in SMEs prediction model can lead to more accurate and reliable results for these firms.

¹⁷ The Company status is available in FAME database.

UK SMEs Default Prediction Model: Industry and Ownership Structure Effects

In order to control for the possible effect of different industry characteristics on default prediction accuracy, the sample of this study was selected from 22 UK manufacturing industries. The industry effect was included in the SMEs' model by using 21 industry dummies which were regressed against the KPG (Probability of Being Good) as dependent variable. It is worth mentioning that to avoid the problem of multicollinearity; one industry dummy would be dropped in the process and considered as a basis for the analysis. The results of the regression endorse the cross industry effects on default prediction behaviour as most of the industry dummies in the model are highly significant. According to Table 3, the regression results for the main variables of the model are more significant after including the industry effects. In addition, the signs of the coefficients stay the same and are consistent with the relevant literature. These results unequivocally support the effects of different industry characteristics on UK SMEs default prediction and indicate the importance of including the industry factor in the model.

This study also investigated the effect of different ownership forms on UK SMEs default prediction by including three structural dummies (Private, Public, Other) in the model. In the process of regression, the Public dummy is not included in the model and being kept as a comparison group for the analysis to avoid the problem of multicollinearity. The results of the study indicate that all the structural dummies in the model are highly significant and have an important impact on SMEs' model prediction power and reliability. The results also give some insights about the riskiness of different UK SMEs ownership forms. According to Table 3, Private UK SMEs which contains the biggest proportion of firms in the UK economy are more likely to go defaulted as its coefficient negatively affects KPG. The negative effect causes the lower level of KPG (Probability of Being good) for Private SMEs and illustrates that these firms

are riskier than Public SMEs which is selected as a reference group¹⁸. The results are consistent with our expectation as Private SMEs are normally small and more financially vulnerable while Public SMEs are bigger firms with stronger assets and firm financial structure. It also proves that including the ownership structure dummies along with industry dummies enhances the reliability of the model.

Insert Table 3

In order to indicate that the model with industry and ownership effects outperform the previous model, the Likelihood ratio test developed by Greene (1997) is implemented in this study. The test finds the difference between the models based on their likelihood ratio (LR)¹⁹. According to the result of the test, the χ^2 statistics is 1116 which indicates that the models are significantly different from each other. Moreover, the SMEs model including industry and ownership effects shows better fit overall as its log likelihood is higher than the previous model.

UK SMEs Default Prediction Model: Sample Compatibility Test

One of the main objectives of this study is to investigate whether SMEs default prediction models are idiosyncratic to SMEs sample or not. It can be tested by observing the performance of SMEs model in larger firms' Hold-out sample. This sample was created by using the same process as it was used for SMEs. Moreover, in order to make the valid comparison between two different samples, large firms' sample is also created based on the criterion of keeping the default

¹⁸ The results also indicate that Private SMEs are riskier than Unlimited SMEs. However, as Unlimited SMEs constitute the small part of our sample; this study only compares the level of riskiness for Private and Public SMEs.

¹⁹ $\chi^2 = 2(\ln LS - \ln LT)$, where $\ln LS$ and $\ln LA$ represent the log likelihood of the models.

rate of the main sample which is 6% for large firms. Hence, the number of 20 existed defaulted firms is selected and then the random selection process is carried out to select 380 Active firms out of 1800 firms in 2009 .Finally, the relevant explanatory variables are being generated for each firm in 2008 and the regression coefficients of the SMEs' model are applied to estimate KPG of the firms. The cut-off ratio of this sample is 6% which is the default rate of the sample.

After calculating the relevant KPG for each large firm and considering the cut-off value, the defaulted and non-defaulted firms are predicted for 2009 sample. By implementing a simple comparison between the results of the model and the company status of the firms in 2009, the type II and type I errors of prediction are estimated as 40% and 20% respectively. The accuracy rate of the model stands at 70% subsequently. The results of the study indicate that the accuracy ratio of SMEs' model for large firms sample falls even below the accuracy ratio of Ohlson's model for SMEs sample which was 72%. It clearly confirms that SMEs' model which showed 83.5% accuracy for small firms sample is specifically suitable for these firms and not similarly for larger firms. Finally, it can be inferred from the result that SMEs credit risk is idiosyncratic to these firms and should be studied separately in order to reach the most accurate and reliable outcome.

UK SMEs Default Prediction Models: Economic Cycles Analysis

As the data in our sample spans the time between 2000 and 2009, it includes the UK economic recession which approximately began at 2007. Thus, it is crucial to examine the possible effect of economic cycles on SMEs' default prediction accuracy. In order to implement the test, this study develops the default prediction model for three different sub-samples representing different

economic conditions: the sub-sample from 2000 to 2006 which is associated with the time before the recession, the recession sub-sample which is from 2007 to 2009 and the whole sample from 2000 to 2009 which is the main sample of this study. In the next step, the pooled logistic regression runs for prerecession and post recession samples and the results are compared with the former results of the SMEs model.

Insert Table 4

The results in Table 4 approve the effect of economic cycles on default prediction models as the prerecession model shows the best performance out of three models. The only variable which is not significant in the prerecession model is leverage whereas in the main model current ratio and leverage are not significant indicators of UK SMEs default events. Moreover, in compared with the first two models, the recession model doesn't seem to be a reliable predictive model for SMEs default as five of the default indicators in the model are not significant at any significance level. Considering the fact that the three models are made out of exactly the same default indicators, there is no explanation for the difference in their prediction power but economic cycle effects. The results indicate that the accounting-based default prediction models lose their credibility at the time of economic downfall and are less reliable. This also can be observed by comparing the accuracy rate of the three models. To carry out the accuracy test, the scores were calculated for each firm in the hold out sample based on the estimated coefficients of the models. In the next step, the accuracy of the models are obtained by calculating the type I and type II errors of prediction based on the cut-off ratios related to each sample default rate . According to the results, the accuracy ratio of the prerecession model stands at 87% which is greater than 83.5% for the main model. Moreover, as it was expected, the accuracy ratio of the post recession

model plummets down to 75% which is considerably lower than the other two models. The likelihood ratio test also indicates the superiority of the prerecession model over the other two models. Considering the performance of the models and their accuracy rates before and after the recession, it is confirmed that the economic cycles affect the accounting-based default prediction model and unless there is some variables in the model to capture these effects, it leads to biased and unreliable results.

Concluding Remarks

This study employed the financial statement information for more than 30000 UK SMEs from 2000 to 2009 financial year to examine the reliability of the specific accounting-based default prediction model for UK SMEs and improve the model by considering different factors which are expected to be important indicators of SMEs default.

This study contributes to the existed literature in different ways. First of all, controlling for industry and ownership structure effects increased the accuracy and reliability of the default prediction model and makes it possible to investigate the level of riskiness in different UK SMEs ownership forms. One of the most fundamental objectives of this research was to investigate the necessity of having an elaborate and unique default prediction model specifically for SMEs. The study approves this claim by showing the different behaviour of SMEs model in non-SMEs sample. The results indicate that default prediction model specifically built for SMEs is not evenly efficient for large firms' sample. On the other hand, the default prediction model originally built for listed firms doesn't show the same level of accuracy for SMEs sample. These results together confirm that SMEs behaviour in terms of credit risk is independent from its larger counterparts and using the specific default prediction model for SMEs sample increases the accuracy of the results significantly. This study also shed light on the important effect of

economic cycles on the accounting-based default prediction models. The results indicate that the accuracy and reliability of the models are substantially different before and after the recession. Accounting-based models are made out of financial ratios which don't represent the economic conditions precisely. Thus, unless there is some variable in the model to capture the effect of economic cycles, the results of the default prediction model might be biased and not reliable. It can be a case of study for further research in this field. Finally, all these improvements of the model will lead to more precise estimation of small firms' probability of default which is the main input in calculation of capital requirement. It helps the banks to credit their clients with higher level of accuracy and probably benefits SMEs by reducing the banks' capital requirement.

References

- Altman, E., Rijken, H., (2004). How Rating Agencies Achieve Rating Stability. *Journal of Banking and Finance*, No. 28
- Altman, E., Hartzell, J., Peck, M., (1995). A Scoring System for Emerging Market Corporate Debt. *Salomon Brothers* May 15.
- Altman, E.I., Sabato, G., (2005). Modelling Credit Risk for SMEs: Evidence from the U.S. Market. *Abacu*. 43(3), 332-357.
- Altman, E.I., Sabato, G., Wilson, N., (2010). The value of non-financial information in small and medium-sized enterprise risk management. *Journal of Credit Risk*, 6(2), 95-127.
- Basel Committee on Banking Supervision, (2003). The New Basel Capital Accord. www.bis.org.
- Bei, Z., Liu, L., (2005). Empirical Study on Financial Failure Prediction of Listed Companies. *Chinese Business Review*, Vol.4, No.8, pp.73-78.
- Berger, A., (2006). Potential Competitive Effects of Basel II on Banks in SME Credit Markets in the United States. *Journal of Financial Services Research*, Vol.28.
- Blum, M., (1974). Failing company discriminant analysis. *Journal of Accounting Research*, Vol.12, No.1
- Campbell, J.Y., Hilscher, J., Szilagyi, J., (2008). In Search of Distress Risk. *Journal of Finance*, 63(6), 2899-2939.
- Charalambakis, E.C., Espenlaub, S.K., Garrett, I., (2009). Assessing the probability of financial distress of UK firms. *Working Paper*.
- Charitou, A., Neophytou, E., Charalambous, C., (2004). Predicting Corporate Failure: Empirical Evidence for the UK. *European Accounting Review*, Vol.13, No.3, 465-497
- Chen, X., Wang, X., Wu, D., (2010). Credit Risk Measurement and Early Warning of SMEs: An Empirical Study of Listed SMEs in China. *Decision Support System*, Vol.49, pp. 301-310.

- Edmister, R., (1972). An Empirical Test of Financial Ratio Analysis for Small Business Failure Prediction. *Journal of Financial and Quantitative Analysis*.
- Jordan, J., Lowe, J., Taylor, P., (1998). Strategy and Financial Policy in UK Small Firms. *Journal of Business Finance & Accounting*, Vol. 25, pp. 1-27.
- Karels, G.V., Prakash A.J., (1987). Multivariate normality and forecasting of business bankruptcy. *Journal of Business Finance & Accounting*, Vol. 14, No. 4.
- Kolari, J., Shin, H., (2004). Assessing the Profitability and Riskiness of Small Business Lenders in the U.S. Banking Industry. www.sba.gov.
- Lugovskaya, L., (2009). Predicting Default of Russian SMEs on the Basis of Financial and Non-Financial Variables. *Journal of Financial Services Marketing*, Vol.14, pp.301-313
- Lussier, R.N., (1995). A non-financial business success versus failure prediction model for young firms. *Journal of Small Business Management*, Vol. 33, No. 1.
- Matlay, H., Westhead, P., (2005). Virtual teams and the rise of e-entrepreneurship in Europe. *International Small Business Journal*, Vol. 23, No.3, pp. 279-302.
- Micha, B., (1984). Analysis of business failures in France. *Journal of Banking and Finance*, Vol. 8
- Michaelas, N., Chittenden, F., Poutziouris, P., (1999). Financial Policy and Capital Structure Choice in UK SMEs: Empirical Evidence from Company Panel Data. *Small Business Economics*, Vol. 12, pp.113-130.
- Ohlson, J.A., (1980). Financial Ratios and the Probabilistic Prediction of Bankruptcy. *Journal of Accounting Research*, 18(1), 109-131.
- Pederzoli, C., Torricelli, C., (2010). A Parsimonious Default Prediction Model for Italian SMEs. *CEFIN*, No.22.
- Richardson, F.M., Kane, G.D., Lobingier, P., (1998). The Impact of Recession on The Prediction of Corporate Failure. *Journal of Business Finance & Accounting*, 25(1) & (2).
- Ryo, H., Hideaki, H., (2010). Small Business Credit Scoring: Evidence from Japan. *RIETI Discussion Paper Series 10-E-029*
- Smyrnios, K., Tanewski, G., Romano, C., (1998). Development of a Measure of the Characteristics of Family Business. *Family Business Review*, Vol.11, No.1, pp. 49-60.
- Sohn, S., Kim, H., (2007). ` *European Journal of Operational Research*, Vol.183, pp. 472-478.
- Taffler, R.J., (1983). The Assessment of Company Solvency and Performance Using a Statistical Model. *Accounting and Business Research*, 15, 295-308

Volume III - Statistical Report. *EIB Annual Report 2008*. EIB, June 2009

Zambaldi, F., Aranha, F., Lopes, H., Politi, H., (2009). Credit Rating to Small Firms: A Brazilian Case. *Journal of Business Research*, pp. 7.

Tables of Results

Table 1: Regression Results of SMEs Model Including Time Factor

KPG	Coef.	Std.Err.	Z	P>Z
Profitably	0.3466	0.0228	15.230	0.0000
Leverage	-0.0000	0.0000	-0.5800	0.5620
Coverage	0.0003	0.0000	11.440	0.0000
Activity	0.1833	0.0179	10.250	0.0000
Liquidity	0.8731	0.2014	4.3400	0.0000
Capitalemployedtotalliability	0.0835	0.0106	7.9000	0.0000
Currentassetstocurrentliabilities	0.0077	0.0074	1.0400	0.3000
Tradedebtorstotalassets	0.6116	0.0626	9.7800	0.0000
Quickassetstocurrentassets	0.7053	0.1594	4.4200	0.0000
Totalliabilitiesquickassets	-0.0000	0.0000	-2.3600	0.0180
Tradecreditortotalliabilities	-0.4075	0.0520	-7.8300	0.0000
Cashnetworth	0.0040	0.0016	2.5900	0.0100
Shorttermdebttonetworth	-0.0005	0.0001	-3.2500	0.0010
_cons	1.9952	0.0266	74.9300	0.0000

*Log likelihood = -40482.1

*Time dummies were not displayed due to space

Table 2: Regression Results of Ohlson's Model Including Time Factors

PD	Coef.	Std.Err.	Z	P>Z
FFOTL	-0.000	0.000	-0.240	0.813
WCTA	-0.017	0.008	-2.230	0.025
TLTA	0.001	0.000	2.510	0.012
CLCA	0.000	0.000	0.590	0.558
Size	-0.206	0.003	-66.520	0.000

NITA	-0.000	0.000	-0.750	0.452
OENEG	0.238	0.017	13.940	0.000
INTWO	0.356	0.018	19.610	0.000
CHIN	-0.131	0.016	-8.210	0.000
_cons	-2.259	0.030	-75.360	0.000

* Log likelihood = -60085.479

*Time dummies were not displayed due to space

*FFOTL, CLCA and NITA coefficients are displayed zero as they have very small values, but the actual values are different from zero and the relevant signs can be interpreted.

Table 3: SMEs' Model Including Industry and Ownership Structure Effects

KPG	Coef.	Std.Err.	Z	P>Z
Profitably	0.3636	0.0232	15.6900	0.0000
Leverage	-0.0000	0.0000	-0.6500	0.5170
Coverage	0.0003	0.0000	11.3000	0.0000
Activity	0.1567	0.0179	8.7400	0.0000
Liquidity	0.9465	0.2040	4.6400	0.0000
Capitalemployedtotalliability	0.0789	0.0105	7.4900	0.0000
Currentassetstocurrentliabilities	0.0116	0.0073	1.6000	0.1090
Tradedebtorstotalassets	0.5781	0.0635	9.1000	0.0000
Quickassetstocurrentassets	0.8144	0.1617	5.0400	0.0000
Totalliabilitiesquickassets	-0.0000	0.0000	-2.1700	0.0300
Tradecreditorstotalliabilities	-0.3617	0.0528	-6.8600	0.0000
Cashnetworth	0.0039	0.0016	2.5000	0.0120
Shorttermdebtonetworth	-0.0004	0.0001	-3.1100	0.0020
Private	-0.5563	0.0442	-12.600	0.0000
Other	0.6867	0.0594	11.5600	0.0000
_cons	1.7010	0.0711	23.9200	0.0000

*Log likelihood = -39924.841

*Industry and Time dummies were not included in the model due to the space

Table 4: UK SMEs Default Prediction Results Including Economic Cycles

VARIABLES	Whole Sample KPG	Pre-recession Sample KPG	Post-recession Sample KPG
Profitability	0.347*** (0.0228)	0.443*** (0.0286)	0.199*** (0.0368)
Leverage	-2.15e-05 (3.72e-05)	-2.90e-05 (4.96e-05)	-7.51e-05 (6.78e-05)
Coverage	0.000289*** (2.52e-05)	0.000288*** (2.68e-05)	0.000299*** (7.94e-05)
Activity	0.183*** (0.0179)	0.188*** (0.0200)	0.226*** (0.0461)
Liquidity	0.873*** (0.201)	0.987*** (0.221)	2.442*** (0.669)
Capitalemployedtotalliability	0.0835*** (0.0106)	0.104*** (0.0121)	0.0129 (0.0136)
Currentassetscurrentliabilities	0.00767 (0.00741)	0.0295*** (0.00944)	0.0138 (0.0109)
Tradedebtorstotalassets	0.612*** (0.0626)	0.521*** (0.0684)	0.891*** (0.180)
Quickassetscurrentassets	0.705*** (0.159)	0.649*** (0.173)	2.691*** (0.559)
Totalliabilitiesquickassets	-8.94e-06** (3.79e-06)	-7.25e-06* (4.10e-06)	-1.18e-05 (1.13e-05)
Tradecreditorstotalliabilities	-0.407*** (0.0520)	-0.424*** (0.0566)	-0.0693 (0.159)
Cashnetworth	0.00405*** (0.00156)	0.00384** (0.00161)	0.0107** (0.00540)
Shorttermdebtnetworth	-0.000460*** (0.000141)	-0.000347** (0.000146)	-0.00175*** (0.000511)
Constant	1.995*** (0.0266)	1.706*** (0.0291)	3.207*** (0.0754)
Observations	97,832	68,580	29,252

TESTING CAUSAL RELATION AMONG CENTRAL AND EASTERN EUROPEAN EQUITY MARKETS: EVIDENCE FROM ASYMMETRIC CAUSALITY TEST

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ABSTRACT

The aim of this study is to analyze the presence of causal link among financial markets of Central and Eastern Europe (CEE) countries by means of asymmetric causality test proposed by Hatemi-J (2012b) for the periods of 1995-2012. We also examine whether there are financial integration between Germany and CEE equity markets. The standard causality test results suggest the presence of causality relation running from the Czech Republic to Poland, and also Hungary and Poland stock markets are found to be Granger cause of Turkey stock markets. Asymmetric causality test results indicate only a causal link going from the Czech Republic to Poland. Finally, we cannot determine the presence of financial integration between Germany and CEE equity markets because the null hypothesis of non-causality cannot be rejected.

Keywords: Stock Markets, Financial Integration, Causality, CEE Equity Markets

1. INTRODUCTION

The issue of financial market integration has crucial importance in terms of both theoretical and practical in finance literature. Practically, international investors need information on the financial market integration in order to determine the potential risks of their portfolio because one of the main principles of diversification is to construct a portfolio by using uncorrelated returns among financial markets. Theoretically, financial market integration that indicates the presence of strong information flows (or causality relation) among markets is related to market efficiency. It is well known that the efficient market hypothesis suggests that prices in the stock markets that full reflect all available information follows random walk process. Hence prices in the stock markets cannot be predicted by using own past value or other variables. In that way, it can be said that evidence in favor of financial market integration suggests the lack of efficiency in financial markets because the presence of market integration implies causality relation among financial markets. Moreover, policy makers can consider dynamic relation among stock markets to construct optimal policies against contagion effects of financial crises. Therefore, large number of studies in the literature has examined the presence of dynamic relation (e.g. integration, causality) among stock markets by using different econometrics methods.

Empirical results in the literature suggest that interdependency among financial markets has significantly increased recently due to several factors namely globalization, bilateral trade, economic integration, financial liberalization and advances in information processing technology. In this context, Pretorius (2002) empirically examined fundamentals of financial integration and found that bilateral trade and industrial production growth differential are important factors in explaining the interdependency. Demian (2011) showed that financial and economic factors are the main sources of integration among European stock markets. Furthermore, Ratanapakorn and Sharma (2002) indicated that strong economic integration,

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policy coordination and trade among relevant regions are the reasons of increasing financial integration. Hatemi-J (2012a) emphasized the importance of financial integration for emerging countries in terms of economic growth and financial system. In this context, it can be said that many emerging markets have opened up their financial markets to foreign investors for attracting foreign direct investment and capital to promote economic growth. In addition, financial market integration is important to develop the financial system to be able to make the flow of liquidity more efficient.

On the other hand, some studies in the literature determined that the most important pitfall of financial integration is contagion effects of global and local financial crises (e.g. 1997 South-East Asian crisis, 1998 Russian crisis, and 2008 global financial crisis). Ratanapakorn and Sharma (2002) explained the reasons why financial crises quickly spread to the other countries. First factor is named common shocks in which sharp decrease or increase in the world interest rate, aggregate demand, commodity prices can increase stress on the economy. Second, significant currency depreciation in one country experiencing a financial crisis may affect other countries through trade spillovers due to the improved price competitiveness of the crisis country. Third, the occurrence of a crisis in one or more countries may induce investors to rebalance their portfolios for risk management or other reasons. Fourth, a crisis in one country may wake up other financial markets to reassess their countries' circumstances.

The main objective of this study is to examine the presence of causal link among financial markets of Central and Eastern Europe (CEE) countries namely the Czech Republic, Hungary, Poland and Turkey. This paper contributes to this literature in several aspects. First, studies in the literature generally examine causality relation among stock markets of CEE by using standard causality test or multivariate GARH models but these testing procedures assume that the impact of a positive shock is the same as the impact of negative shock in the absolute terms. However, Hatemi-J (2012b) indicated that this is very restrictive assumption because investors tend to react more to negative news than positive news. Also, the presence of asymmetric information can cause to find asymmetric causal link between financial markets. Therefore, we investigate the existence of causal link among CEE countries by means of asymmetric causality test proposed by Hatemi-J (2012b) and to the best of our knowledge; this is the first investigation for CEE countries by using asymmetric causality test. Secondly, it is well known that standard causality test procedure relies on some distributional assumptions (e.g. normality, homoscedasticity, etc.) but the most of the financial series exhibit non-normality and ARCH effect and hence standard critical values cannot be used for testing causality relation. Therefore, we employ a bootstrap simulation approach to obtain critical values in this study. We focus on CEE equity markets because these countries are the members of the European Union and they are aspiring to adopt the euro zone. Therefore, it can be expected the presence of financial integration among these countries because joining the EU entails substantial increase in capital, factor and product market integration among member states.

The rest of the paper is organized as follows. In section 2, we present briefly literature review on the financial integration. Section 3 explains the general econometric framework for testing asymmetric causality. In Section 4, we present the empirical results and discuss their implications, and finally in Section 5 it covers the conclusion of the study.

2. LITERATURE REVIEW

Economic integration among countries and regions has significantly increased over the past decades in the world and this phenomenon cause to raise attention of investors and academic scholars to the issue of financial integration among these markets around the world. Therefore, there are extended literatures that focus on relation among financial markets. In this section, we briefly summarize these studies.

The studies in the literature can be classified into three groups. The first group has generally employed conventional cointegration test and standard causality test. For instance, Ratanapakorn and Sharma (2002)

examined short-term and long-term relation in five regional stock indices by using VAR model and cointegration test for the pre-Asian crisis and Asian crisis. Their empirical findings showed that local crisis such as Gulf War, Japanese stock market decline and Mexican peso crisis did not affect the US market in terms of causal sense in the pre-Asian crisis. During the crisis periods, the European market was found to be Granger cause of the US stock market. More importantly, they found that Asian crisis spread to not only Latin American or Eastern Europe-Middle East markets but also to Europe and the US stock market. Onay (2006) examined the long-run financial integration of second round acceding and candidate countries namely Bulgaria, Croatia, Romania and Turkey with the US and Europe Union stock markets. Johansen cointegration results suggested the lack of long-run relation between second round countries and the EU and US stock markets. However, the Granger causality test results showed causal link running from the EU and US stock markets to Croatian stock markets and also from Turkish stock market to Bulgarian stock market. Mandacı and Torun (2007) analyzed stock market integration for Turkey, Brazil, Russia, Korea and Poland by using cointegration and causality tests. Their empirical result showed the presence of short-run and long-run relation between Brazil and Polish and Russian and Korean stock markets. Demian (2011) examined the effect of EU accession on financial market integration for the new member of European Union such as the Czech Republic, Estonia, Hungary, Poland, Romania and Slovakia. While empirical evidence show that the presence of cointegration relation among stock markets, the effects of EU accession are found to be very small. He also indicated that the main sources of integration among European stock markets are financial and economic factors. Differently from these studies, Pretorius (2002) investigated determinants that lead to increase integration among emerging stock markets. Hence, the fundamental factors were classified as contagion effect, economic integration and stock market characteristics. Empirical results suggested that bilateral trade and industrial production growth differential is found to be significant in explaining the correlation between two countries stock markets. Furthermore, Pretorius (2002) indicated that countries in the same region are more correlated than countries in different regions.

However, conventional cointegration and causality tests have been criticized for having low power to reject null hypothesis when there are structural break in the series and hence the second group has focused on possible structural breaks in the cointegration relation. In this context, Korkmaz et al. (2008) investigated the long-run cointegration relation among Turkish stock market, the stock markets of 17 EU member countries and the stock markets of Turkey's 10 largest trading partners via Johansen and Gregory-Hansen cointegration tests. Empirical findings suggested that Turkish stock market is cointegrated with the equity markets of 11 European Union countries and the equity markets of 7 countries with which Turkey has a high trade volume. Kenourgios and Smitas (2011) examined long-run relation among five Balkan emerging stock markets (Turkey, Romania, Croatia and Serbia), the US and three developed European markets (the UK, Germany and Greece) by Gregory-Hansen cointegration test and multivariate GARCH model. They found evidence in favor of long-run relation among Balkan markets, and between Balkan and developed markets. Federova (2011) investigated contagion effects among Eastern European stock markets (Poland, Hungary and the Czech Republic) by means of multivariate GARCH model and found that direct linkages between different stock market sectors significantly increase after EU accession in 2004. Onal and Unay (2012) examined the presence of long-run financial integration and extreme dependence between Turkey and Brazil stock markets. Although Johansen cointegration test procedure fails to find financial integration between stock exchange markets, Gregory-Hansen cointegration test that allow structural breaks in the cointegration equation suggest the existence of long-run relation between Turkey and Brazil. In addition, they showed that time-varying correlations between Turkey and Brazil that was obtained from DCC-GARCH model indicate strong relation for both systemic and local crises periods.

The last group of studies examines the presence of nonlinear and asymmetric dynamic relation among financial markets. Ozdemir and Cakan (2007) focused on nonlinearity in the financial markets when they examined causality relation and hence they employed nonlinear causality test to investigate the dynamic relation between the major stock indices of the US, Japan, France and the UK. Empirical findings showed

the presence bidirectional causal relation between the US and the UK stock markets. Qiao et al. (2011) investigated dynamic relation among stock markets of the US, Australia and New Zealand by using regime dependent impulse-response functions. Empirical results suggested the presence of two regimes in three stock markets and correlations among three markets are significantly higher in a bear regime than bull regime. Also, regime-dependent impulse-response functions implied that integration among the three stock markets is stronger and more persistent in the bear regime than in the bull regime. Hatemi-J (2012) analyzed causality relation between the United Arab Emirates (UAE) and the US financial market by means of both symmetric and asymmetric causality test. Standard symmetric causality test result indicates the lack of causal link between financial markets. On the other hand, asymmetric causality test results imply the existence of causal link between the UAE and the US financial markets and these findings imply the UAE financial market is integrated with the US financial market. It is also found that causal link for the bear market is stronger than for the bull market. Çevik et al. (2012) examined regime-dependent causality relation among the US, Germany and Turkish financial markets by using Markov regime switching VAR (MS-VAR) model. They identified the regimes as bear and bull market and then employed causality test and impulse-response functions. Their empirical results are in line with Hatemi-J because causal link between financial markets for the countries in question is varied for the regimes. For instance, it is determined a causal link running from the US to Turkey in the bull market and from the US to Germany in the bear market. Nevertheless, the causality relation cannot be determined between Germany and Turkey in both regimes.

3. ECONOMETRIC FRAMEWORK

3.1. Unit Root Tests

In this paper, we first examine the existence of unit root in the stock market indices by using the augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) unit root tests. However, Perron (1989) argued that conventional unit root tests have low power to reject the null hypothesis of nonstationarity when there is a structural break in the series. To overcome this problem, Perron (1989) modified the augmented Dickey Fuller (ADF) test by adding dummy variables to account for structural breaks at known points in time. Zivot and Andrews (1992) suggested that structural breaks in the series may be endogenous and they extended Perron's methodology to allow for the endogenous estimation of the break date. We employ the following two alternative models proposed by Zivot and Andrews (hereafter ZA) to examine the presence of unit root with structural break in the stock market price series:

$$\text{Model A: } \Delta p_t = \mu + \theta DU_t(\lambda) + \beta t + \alpha p_{t-1} + \sum_{j=1}^k c_j \Delta p_{t-j} + e_t \quad (1)$$

$$\text{Model C: } \Delta p_t = \mu + \theta DU_t(\lambda) + \beta t + \gamma DT_t(\lambda) + \alpha p_{t-1} + \sum_{j=1}^k c_j \Delta p_{t-j} + e_t \quad (2)$$

where p_t indicates stock market price index, DU_t and DT_t are indicator variables for mean shift and trend shift for the possible structural break-date (TB) and they are described as following:

$$DU_t = \begin{cases} 1 & \text{if } t > TB \\ 0 & \text{otherwise} \end{cases} \quad DT_t = \begin{cases} t - TB & \text{if } t > TB \\ 0 & \text{otherwise} \end{cases}$$

The null hypothesis of unit root ($\alpha=0$) can be tested against stationary with structural breaks ($\alpha<0$) in Equations 1 and 2. Every time points are considered as a potential structural break date in the ZA unit root test and the break date is determined according to minimum one-sided t-statistic.

3.2. Asymmetric Causality Test

In this study, we employ asymmetric causality test proposed by Hatemi-J (2012b) to determine the upside and downside causal link among equity markets of CEE countries. Qiao et al. (2011) and Çevik et al. (2012) showed that dynamic relations among financial markets are varied due to stock market regimes (bear and bull market periods). It can be expected because investors tend to react more to negative shocks than to positive ones even in cases when the size of the shock is the same in absolute terms. These findings imply the presence of asymmetric relation among financial markets and standard causality tests do not take into account the potential asymmetric property of the underlying data. In this context, it is assumed that the positive and negative shocks may different causal impacts in the asymmetric causality test. In order to describe the asymmetric causality relation between two integrated variables such as y_{1t} and y_{2t} , the variables are first defined as the following random walk process:

$$y_{1t} = y_{1t-1} + \varepsilon_{1t} = y_{10} + \sum_{i=1}^t \varepsilon_{1i} \quad \text{and} \quad y_{2t} = y_{2t-1} + \varepsilon_{2t} = y_{20} + \sum_{i=1}^t \varepsilon_{2i} \quad (3)$$

where $t = 1, 2, \dots, T$, the constants y_{10} and y_{20} are the initial values and the variables ε_{1i} and ε_{2i} imply white noise residuals. Positive and negative shocks can be defined respectively as the following:

$$\varepsilon_{1i}^+ = \max(\varepsilon_{1i}, 0), \quad \varepsilon_{2i}^+ = \max(\varepsilon_{2i}, 0), \quad \varepsilon_{1i}^- = \min(\varepsilon_{1i}, 0), \quad \text{and} \quad \varepsilon_{2i}^- = \min(\varepsilon_{2i}, 0).$$

Therefore, residuals can be defined sum of positive and negative shocks as $\varepsilon_{1i} = \varepsilon_{1i}^+ + \varepsilon_{1i}^-$ and

$$\varepsilon_{2i} = \varepsilon_{2i}^+ + \varepsilon_{2i}^-. \quad \text{It follows that} \quad y_{1t} = y_{1t-1} + \varepsilon_{1t} = y_{10} + \sum_{i=1}^t \varepsilon_{1i}^+ + \sum_{i=1}^t \varepsilon_{1i}^- \quad \text{and} \quad \text{similarly}$$

$$y_{2t} = y_{2t-1} + \varepsilon_{2t} = y_{20} + \sum_{i=1}^t \varepsilon_{2i}^+ + \sum_{i=1}^t \varepsilon_{2i}^-$$

Finally, the positive and negative shocks of each variable can be defined in a cumulative form as

$$y_{1t}^+ = \sum_{i=1}^t \varepsilon_{1i}^+, \quad y_{1t}^- = \sum_{i=1}^t \varepsilon_{1i}^-, \quad y_{2t}^+ = \sum_{i=1}^t \varepsilon_{2i}^+, \quad \text{and} \quad y_{2t}^- = \sum_{i=1}^t \varepsilon_{2i}^-. \quad \text{Note that, by construction, each positive as well}$$

as negative shock has a permanent impact on the underlying variable. The next step is to test the causal relationship between these components. We will only describe the case of testing for causal relationship between positive cumulative shocks. Assuming that $y_t^+ = (y_{1t}^+, y_{2t}^+)$, the test for causality can be employed by using the following vector autoregressive model of order p , VAR(p)²⁰:

$$y_t^+ = v + A_1 y_{t-1}^+ + \dots + A_p y_{t-p}^+ + u_t^+ \quad (4)$$

where y_t^+ is the 2×1 vector of variables, v is the 2×1 vector of intercepts, and u_t^+ is a 2×1 vector of residuals terms. The matrix A_r is a 2×2 matrix of parameters for lag order r ($r = 1, \dots, p$). As in Hatemi-J (2012a and 2012b), we consider model information criterion proposed by Hatemi-J (2003) in order to select the optimal lag lengths. The null hypothesis of no causality can be tested by Wald restriction for the autoregressive parameters. Wald test statistic has an asymmetric χ^2 distribution in which the number of degrees of freedom is equal to number of restriction. However, most financial series exhibit non-

²⁰ Note that Hatemi-J (2012b) considered Toda-Yamamoto (1995) principle to conduct asymmetric causality test procedure. In this context, Toda-Yamamoto test procedure consists of three steps. In the first step, maximum order of integration of variables (d_{max}) should be determined by using unit root tests. In the second step, optimal lag length of the VAR system (r) should be determined via model information criterions and then the VAR system with $(r+d_{max})^{th}$ order should be estimated. In the final step, a standard Wald test with an asymptotic χ^2 distribution is employed for testing the presence causal link between the variables.

normality and ARCH effect and hence we employ bootstrap simulation procedure with 10000 replications to determine critical values.

4. DATA AND EMPIRICAL RESULTS

In this study, the monthly index return data are used to examine the relations between these five market (Czech Republic, Hungary, Poland, Turkey and Germany) returns for the time period January 1995 to July 2012. The data for these equity markets is retrieved from MSCI-Barra. All the returns are listed in U.S. dollar. The logarithmic stock market price index series are used in the empirical analysis.

Table 1 presents the descriptive statistics that includes the monthly arithmetic returns, the standard deviation, skewness, and kurtosis. The average monthly return in these equity markets range from 0.737% (in Hungary) to 0.301% (in Poland). For these equity markets, the volatility ranges from 7.19% (in Germany) to 15.36% (in Turkey). Also all return series show the evidence of strong skewness and excess kurtosis, which indicates that they are leptokurtic except for Germany.

Table 1: Descriptive Statistics

Countries	n	Mean (%)	Std. Dev.	Skewness	Kurtosis
Czech Republic	211	0.662	8.651	-0.656	4.827
Hungary	211	0.737	11.659	-1.063	7.000
Poland	211	0.301	10.997	-0.455	4.604
Turkey	211	0.733	15.361	-0.285	4.473
Germany	211	0.334	7.188	-0.870	1.937

The correlations among stock returns series are presented in Table 2. The correlations among the markets are all positive and found to be significant at 1% significance level. The lowest correlation is 0.423 that occurs between Turkey and Czech Republic. The highest correlation within these markets is 0.725 that occurs between Hungary and Czech Republic. Hungary has the highest correlation (0.665) with Germany. Common factors that affect these correlations are trade relationships, industry structure, political stability, geographical location, natural resources, local macro economic factors (inflation, interest rate, trade deficit, budget deficit, money supply, industrial production, foreign reserve money, GDP per capita, foreign and domestic debt), liberalization, strong local currency, unemployment, capital market structure, investors' protection and disclosure requirements, tax structure, number of multinational companies, and advance technology.

Table 2: Correlations among Stock Returns Series

Countries	Czech Republic	Hungary	Poland	Turkey	Germany
Czech Republic	1.000				
Hungary	0.725***	1.000			
Poland	0.696***	0.783***	1.000		
Turkey	0.423***	0.543***	0.472***	1.000	
Germany	0.550***	0.665***	0.656***	0.529***	1.000

Note: *** indicates significant correlation coefficient at the 1% level.

We start our analysis by first testing of unit root in the stock market price index series by means of the augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) unit root tests and tests results are presented in Table 3. We cannot reject the null hypothesis of unit root for all series in levels. On the other hand, when

we consider first differences of the series, the null hypothesis is rejected for all series at 1% significance level.

Table 3: Unit Root Test Results

Countries	Level		First Differences	
	ADF	PP	ADF	PP
Czech Republic	-1.436	-1.540	-12.919***	-12.922***
Hungary	-2.249	-2.257	-12.984***	-12.960***
Poland	-2.093	-2.091	-14.663***	-14.663***
Turkey	-2.855	-3.031	-14.545***	-14.553***
Germany	-2.260	-2.380	-13.504***	-13.528***

Note: The optimal number of lags is selected according to the Schwarz BIC. ***, ** and * indicate that the series in question is stationary at the 1%, 5% and 10% significance level, respectively.

As well-known in the literature, linear unit root tests lack power when there are structural breaks in the series. Therefore, we now turn to the examination of unit root process with structural break for the series via ZA test and test results are presented in Table 4. Again we cannot reject the null hypothesis of unit root in levels and these results are consistent with ADF and PP tests results. All unit root tests results suggest that all stock market price index series are stationary in first differences and this finding implies that maximum order of integration of variables (d_{max}) is one.

Table 4: Zivot-Andrews Structural Break Test Results

Countries	Test Statistics		Break Periods	
	Model A	Model C	Model A	Model C
Czech Republic	-3.269	-2.904	2003M12	2004M08
Hungary	-3.356	-3.485	2008M08	2004M08
Poland	-3.823	-3.662	2004M09	2004M09
Turkey	-3.970	-4.065	2000M11	2000M11
Germany	-2.729	-2.805	2004M09	2000M04

Note: -4.58, -4.80 and -5.43 are critical values for Model A at 10%, 5% and 1% significance levels respectively. -4.820, -5.08 and -5.57 are critical values for Model C at 10%, 5% and 1% significance levels respectively.

Then, we examine causality relation among CEE countries via asymmetric causality test proposed by Hatemi-J (2012b) and the results are presented in Table 5. According to the standard causality test result, we determine causality relation at 5% significance level in which direction of causal link is running from the Czech Republic to Poland and from Poland to Turkey. We also determine the presence of causal link going from Hungary to Turkey at 10% significance level.

Table 5: Hatemi-J Asymmetric Causality Test Results among CEE Equity Markets

Causality Direction	Test Value	VAR order	CV 1%	CV 5%	CV 10%
Czech Republic → Hungary	1.064	1	6.767	3.842	2.693
Czech Republic ⁺ → Hungary ⁺	3.085*	1	6.779	3.918	2.749
Czech Republic ⁻ → Hungary ⁻	0.646	1	8.440	3.887	2.622
Hungary → Czech Republic	0.012	1	6.763	3.791	2.678
Hungary ⁺ → Czech Republic ⁺	0.015	1	8.714	3.956	2.593
Hungary ⁻ → Czech Republic ⁻	0.095	1	7.004	3.777	2.632
Czech Republic → Poland	4.152**	1	6.821	3.931	2.734
Czech Republic ⁺ → Poland ⁺	25.786***	2	9.379	5.936	4.617
Czech Republic ⁻ → Poland ⁻	12.967***	1	8.533	4.085	2.704
Poland → Czech Republic	0.654	1	7.063	3.781	2.659

Poland ⁺ → Czech Republic ⁺	0.460	1	7.040	3.897	2.680
Poland ⁻ → Czech Republic ⁻	0.149	1	7.523	3.849	2.623
Czech Republic → Turkey	0.306	1	6.736	3.907	2.699
Czech Republic ⁺ → Turkey ⁺	0.072	1	6.886	3.845	2.655
Czech Republic ⁻ → Turkey ⁻	0.553	1	7.839	4.021	2.750
Turkey → Czech Republic	0.003	1	6.614	3.920	2.713
Turkey ⁺ → Czech Republic ⁺	0.999	1	7.101	3.962	2.738
Turkey ⁻ → Czech Republic ⁻	1.477	1	7.359	3.803	2.666
Hungary → Poland	2.056	1	6.844	3.871	2.639
Hungary ⁺ → Poland ⁺	0.002	1	7.239	4.044	2.737
Hungary ⁻ → Poland ⁻	1.148	1	8.136	3.865	2.541
Poland → Hungary	0.205	1	6.739	3.765	2.675
Poland ⁺ → Hungary ⁺	0.856	1	7.218	4.080	2.805
Poland ⁻ → Hungary ⁻	0.002	1	7.938	3.831	2.512
Hungary → Turkey	3.279*	1	6.498	3.748	2.670
Hungary ⁺ → Turkey ⁺	0.112	1	7.200	3.892	2.736
Hungary ⁻ → Turkey ⁻	2.158	1	7.703	3.882	2.683
Turkey → Hungary	0.027	1	6.621	3.777	2.630
Turkey ⁺ → Hungary ⁺	0.233	1	7.125	3.944	2.790
Turkey ⁻ → Hungary ⁻	0.000	1	7.572	3.930	2.576
Poland → Turkey	4.593**	1	6.599	3.872	2.654
Poland ⁺ → Turkey ⁺	1.789	1	7.399	3.851	2.683
Poland ⁻ → Turkey ⁻	1.790	1	7.912	4.065	2.707
Turkey → Poland	1.994	1	6.911	3.928	2.697
Turkey ⁺ → Poland ⁺	0.190	1	7.092	3.987	2.786
Turkey ⁻ → Poland ⁻	0.418	1	7.243	3.895	2.626

Note: “+” and “-” indicate upside and downside causality relation respectively. *, ** and *** indicates the existence of causal link at the 1%, 5% and 10% level respectively.

On the other hand, when we look at the asymmetric causality test results in Table 5, the Czech Republic stock market is found to be Granger cause of Poland stock market in downside and upside at 1% significance level. Note that downside and upside causality relations seem to be stronger than the standard causality results because the null hypothesis of non-causality can be rejected at 1% significant level in the asymmetric causality test.

Finally, we examine whether there are financial integration between Germany and CEE countries. Because Germany is the main trade partners of the countries in question and Germany stock market is the most influential market affecting the CEE markets. The asymmetric causality test results are presented in Table 6. We cannot reject the null hypothesis that German stock market is Granger cause of CEE countries stock markets at conventional significance level. In addition, asymmetric causality test results indicate the lack of causal link between Germany stock market and CEE countries stock market.

Table 6: Hatemi-J Asymmetric Causality Test Results between Germany and CEE Equity Markets

Causality Direction	Test Value	VAR order	CV 1%	CV 5%	CV 10%
Germany → Czech Republic	1.539	1	7.110	3.949	2.745
Germany ⁺ → Czech Republic ⁺	1.978	1	7.188	3.865	2.749
Germany ⁻ → Czech Republic ⁻	1.207	1	7.444	3.834	2.658
Czech Republic → Germany	2.660	1	6.760	3.933	2.785
Czech Republic ⁺ → Germany ⁺	2.010	1	7.163	4.100	2.838
Czech Republic ⁻ → Germany ⁻	1.416	1	8.271	4.235	2.816
Germany → Hungary	2.349	1	6.878	3.853	2.707
Germany ⁺ → Hungary ⁺	2.340	1	7.179	3.954	2.742
Germany ⁻ → Hungary ⁻	1.875	1	7.664	3.747	2.571
Hungary → Germany	0.817	1	6.882	3.849	2.710
Hungary ⁺ → Germany ⁺	0.032	1	7.010	3.842	2.681

Hungary ⁻ → Germany ⁻	0.595	1	8.301	3.918	2.595
Germany → Poland	1.218	1	6.726	3.896	2.743
Germany ⁺ → Poland ⁺	0.179	1	6.632	3.930	2.751
Germany ⁻ → Poland ⁻	2.916	1	7.167	3.758	2.627
Poland → Germany	1.470	1	6.736	3.957	2.734
Poland ⁺ → Germany ⁺	0.546	1	6.959	3.845	2.728
Poland ⁻ → Germany ⁻	1.545	1	7.784	4.005	2.726
Germany → Turkey	2.258	1	6.631	3.866	2.735
Germany ⁺ → Turkey ⁺	0.385	1	6.962	4.003	2.774
Germany ⁻ → Turkey ⁻	2.244	1	7.077	3.786	2.648
Turkey → Germany	0.068	1	6.892	3.880	2.667
Turkey ⁺ → Germany ⁺	0.148	1	7.250	3.940	2.762
Turkey ⁻ → Germany ⁻	0.041	1	7.692	3.883	2.705

Note: “+” and “-” indicate upside and downside causality relation respectively. *, ** and *** indicates the existence of causal link at the 1%, 5% and 10% level respectively.

5. CONCLUSIONS

Issue of financial market integration is important for investors and academic scholars and hence there is a growing literature that focuses on to examine the presence of financial market integration over the past decades. In this context, we analyze the presence of (or lack of) financial market integration among CEE equity markets by using asymmetric causality test proposed by Hatemi-J (2012b) and to the best of our knowledge; this is the first investigation for CEE equity markets by using asymmetric causality test. The standard causality test results suggest the presence of a causal link running from the Czech Republic to Poland and from Poland to Turkey at 5% significance level. On the other hand; the asymmetric causality test results indicate that the Czech Republic stock market is Granger cause of Poland stock market in downside and upside at 1% significance level. Note that downside and upside causality relations seem to be stronger than the standard causality results because the null hypothesis of non-causality can be rejected at 1% significant level in the asymmetric causality test. In addition, the Czech Republic stock market is found to be Granger cause of Hungarian stock market in upside at 10% level. Finally, we cannot determine the presence of causality relation between Germany and CEE equity markets and these findings can be considered for the international investors in making their portfolio decisions. High level of integration or segmentation helps to formulate reasonable financial decisions and models to forecast stock market returns.

REFERENCES

- Çevik, Emrah İ., Nuket K. Çevik., and Serhan Gürkan, (2012), “ABD, Almanya ve Türkiye Hisse Senedi Piyasaları Arasındaki İlişkinin MS-VAR Modeli İle Analizi,” *BDDK Bankacılık ve Finansal Piyasalar Dergisi*, 6(1): 133-155.
- Demian, Calin-Vlad (2011), “Cointegration in Central and East European Markets in Light of EU Accession,” *Journal of International Financial Markets, Institutions & Money*, Vol. 21: 144-155.
- Federova, Elena (2011), “Transfer of Financial Risk in Emerging Eastern European Stock Markets: A Sectoral Perspective,” *BOFIT Discussion Papers* 24.
- Hatemi-J, Abdunnasser (2003), “A New Method to Choose Optimal Lag Order in Stable and Unstable VAR Models,” *Applied Economics Letters*, 10(3): 135–137.
- Hatemi-J, Abdunnasser (2012a), “Is the UAE Stock Market Integrated with the USA Stock Market? New Evidence from Asymmetric Causality Testing,” *Research in International Business and Finance*, Vol. 26: 273-280.
- Hatemi-J, Abdunnasser (2012b), “Asymmetric Causality Tests with an Application,” *Empirical Economics*, DOI: 10.1007/s00181-011-0484-x, forthcoming.
- Kenourgios, Dimitris and Aristeidis Samitas (2011), “Equity Market Integration in Emerging Balkan Markets,” *Research in International Business and Finance*, 25(3): 296-307.

- Korkmaz, Turhan, Selin Zaman, and Emrah İsmail Çevik (2008), “İMKB’nin Avrupa Birliği ve Türkiye’nin Yüksek Dış Ticaret Hacmine Sahip Ülke Borsaları ile Entegrasyon İlişkisi,” *Zonguldak Karaelmas Üniversitesi Sosyal Bilimler Dergisi*, 4(8): 19-44.
- Mandacı, Pınar Evrim and Erdost Torun (2007), “Testing Integration between the Major Emerging Markets,” *Central Bank Review*, Vol. 1, 1-12.
- Onay, Ceylan (2006), “A Co-integration Analysis Approach to European Union Integration: The Case of Acceding and Candidate Countries,” *European Integration Online Papers*, 10(7): 2-11.
- Onay, Ceylan and Gözde Ünal (2012), “Cointegration and Extreme Value Analyses of Bovespa and Istanbul Stock Exchange,” *Czech Journal of Economics and Finance*, 62(1): 66-91.
- Ozdemir, Zeynel Abidin and Esin Cakan (2007), “Non-linear Dynamic Linkages in the International Stock Markets,” *Physica A*, Vol. 377: 173-180.
- Perron, Pierre (1989), “The Great Crash, the Oil Price Shock, and the Unit Root Hypothesis,” *Econometrica*, Vol. 57: 1631-1401.
- Pretorius, Elna (2002), “Economic Determinants of Emerging Stock Market Interdependence,” *Emerging Markets Review*, Vol. 3: 84-105.
- Qiao, Zhuo, Yuming Li, and Wing-Keung Wong (2011), “Regime-dependent Relationships among the Stock Markets of the US, Australia and New Zealand: A Markov-switching VAR Approach,” *Applied Financial Economics*, Vol. 21: 1831-1841.
- Ratanapakorn, Orawan and Subhash C. Sharma (2002), “Interrelationships among Regional Stock Indices,” *Review of Financial Economics*, Vol. 11: 91-108.
- Toda, Hiro Y. and Toda Yamamoto (1995), “Statistical Inference in Vector Autoregressions with Possibly Integrated Processes,” *Journal of Econometrics*, 66: 225–250.
- Zivot, Eric and W. K. Donald Andrews (1992), “Further Evidence on the Great Crash, the Oil-price Shock, and the Unit-Root Hypothesis,” *Journal of Business and Economic Statistics*, Vol. 10: 251-270.

Are There Riches in Reputation?

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Abstract

Building a strong company reputation is time consuming and costly. Alternatively, firms can lose or destroy their reputations through misguided activities, and may do so over a short period of time.

Given the market's ability to gauge the long term reputation strategy of a firm, the announcement of a firm's reputation could be argued to be a nonevent. On the other hand, the media outlets feature the announcement of a firm's reputation, reputation management has become an integral part of the consulting industry, and the importance of a firm's reputation has become a central topic of research. As such, the announcement of a firm's reputation may be a significant event. We use the Harris Interactive Survey to investigate the reputation effect.

Each year, Harris Interactive ascertains firms with "the most visible reputations" by asking a large sample of average citizens to identify two firms with the best reputations and two firms with the worst reputations. For the sixty most frequently mentioned firms, respondents are requested to completed additional survey information to create the Harris Reputation Quotient (RQ). Specifically, respondents are asked to evaluate a firm in six dimensions: Vision & Leadership, Social Responsibility, Emotional Appeal, Products and Services, Workplace Environment, and Financial Performance.

Given firms with "the most visible reputations" comprise the list, inclusion on the list could be a positive (an excellent reputation) or a negative (a critical reputation). The announcement of a RQ above 70 was considered to be a positive event for the firm and held "long" in the event study. The announcement of a RQ below 65 was considered a negative event for the firm and held "short" in the event study. Firms reported as Fair (65-69) were not included in the event study. Adjusting for private firms and missing data, the final sample included 536 security-events from 1999 till 2011.

Table I presents the cumulative abnormal returns of the long-short portfolio over three different event windows, using the CRSP Equally Weighted Market Index as the benchmark market portfolio. Both test statistics indicate statistical significance for the positive abnormal return. As a robustness check, the market model was estimated using Scholes-Williams betas, and GARCH(1,1) and EGARCH(1,1) errors structures. In addition, the Fama-French three factor model and the Carhart four factor model were also examined. Although not shown, these results support the market model results in Table I.

At this point, the long-short portfolio results point to a positive abnormal return that appears robust to estimation procedures and risk models. To investigate if the above effect is a positive effect from the "long" firms being recognized for their positive reputation versus a negative effect from the "short" firms being penalized for their negative reputation, the sample was split into a "long" only portfolio and a "short" only portfolio.

Table II and Table III display the "Long" only and the "Short" only results, respectively. In the announcement periods, the short-only portfolio produced statistically significant positive abnormal returns. The long-only portfolio produced statistically significant positive abnormal returns only in the -2 to +30 window at the 10% level.

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As a final check of the information content of the Harris RQ survey, we examine firms that improve (degrade) their reputation and reach a higher (lower) Harris category. Firms that reach a higher Harris category are held long. Firms that drop to a lower Harris category are held short. The results were analogous to those above. Namely, the Long-Short portfolio produced statistically significant abnormal returns, but when examined individually, the “Long” only portfolio results were not statistically significant, but the “Short” only portfolio results were statistically significant.

In this paper, we have found that the announcement of a firm’s reputation by Harris Interactive, primarily those of firms with poor reputations and those firms that experience a degradation in their reputations, produces abnormal returns. One interpretation of these results is that the announcement of a poor reputation conveys more new information than the announcement of an excellent reputation. Building a positive reputation is a long process that the market is able to observe over time. The announcement that a firm has a positive reputation or has improved its reputation provides the market with some marginal information. On the other hand, firms that breed a negative reputation or suffer a degradation in their reputation generate significant new information to the market. One can make the case that a negative reputation can be generated with much greater speed than a positive reputation.

Table I: Market Model Results

Event Window	N	Mean Cumulative Abnormal Return	Median Cumulative Abnormal Return	Precision Weighted CAAR	Patell Z	Standardized Cross-Sectional Test
(-2,+1)	536	0.71%	0.22%	0.34%	2.56**	2.30*
(-2,+10)	536	1.50%	0.31%	0.65%	2.56**	2.16*
(-2,+30)	536	2.45%	1.33%	1.27%	3.09**	3.06**

Table II: Market Model - Long Positions Only

Event Window	N	Mean Cumulative Abnormal Return	Precision Weighted CAAR	Patell Z
(-2,+1)	397	0.02%	-0.04%	-0.294
(-2,+10)	397	0.54%	0.21%	0.765
(-2,+30)	397	1.22%	0.56%	1.294\$

Table III: Market Model - Short Positions Only

Event Window	N	Mean Cumulative Abnormal Return	Precision Weighted CAAR	Patell Z
(-2,+1)	139	2.66%	1.64%	5.55***
(-2,+10)	139	4.26%	2.13%	4.00***
(-2,+30)	139	5.98%	3.63%	4.28***

\$ denotes statistical significance at the 0.10 level, * denotes statistical significance at the 0.05 level,

** denotes statistical significance at the 0.01 level, *** denotes statistical significance at the 0.001 level

Changes in Governance and Hostile Takeovers in Continental Europe: The Case of Arcelor's Takeover by Mittal Steel

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The hostile takeover of Arcelor by Mittal Steel illustrates the changes in governance, the market for corporate control, and mechanism for hostile takeovers that occurred in the last decade in continental Europe. To explain these changes, this paper begins by describing the differences in governance and corporate control between the United States and Europe, the evolution of the market for corporate control in Europe, and changes in the mechanics for hostile takeovers in Europe. We then illustrate how these changes enabled and influenced the course of the hostile takeover of Arcelor by Mittal Steel.

In the United States, the ownership of most firms that are listed in stock exchanges is dispersed among small shareowners, and as a consequence corporate control of these firms lies with their managers. Because of this separation of ownership and control, corporate governance in the U.S. has focused primarily on the problem of alleviating the conflict of interest that can occur between shareholders and powerful management. In contrary, in Europe fewer of the firms that are listed in stock exchanges are widely held by small shareowners. Instead, most of the firms that are listed in stock exchanges in Continental Europe (and indeed around the world) have one dominant shareholder—usually an individual or a family—who controls the voting majority. Often, this controlling shareholder exercises control without directly owning a large fraction of the firm; they exercise control using pyramidal ownership, shareholder agreements, and dual classes of shares.

However, researchers have argued that the European structures do not guarantee that family-controlled firms are always better governed than widely held ones. Family control helps protect shareholders interest against managerial abuse. But families (like managers in widely held firms) can abuse their power and use corporate resources to their own advantage. A common practice is *self-dealing* or *tunneling*: where the family control over the firm is enacted via a pyramidal control structure. By this practice, value is transferred higher up in the pyramid, so that the controlling shareholders own a larger fraction of the firm's cash-flow rights.

Takeovers in Continental Europe had grown from a negligible number of transactions in the early 1980s to a significant number of transactions by the end of the 1990s. However, only in the late 1990s did continental European firms begin to participate aggressively in takeovers. Factors that are commonly attributed to the intensive participation of Continental European firms in the takeover waves of the 1990s and the 2000s include: the introduction of the euro, the globalization process, technological innovation, deregulation and privatization, shareholder activism, the boom in the financial markets (particularly the availability of low cost financing), and the growth of private equity and hedge funds .

Hostile takeovers are considered to be a standard business practice in the United States and in the United Kingdom. In these two countries, firms can freely change control without any restriction (except for antitrust laws): they have what is commonly known as an *active market for corporate control*.

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In contrast, Continental Europe is designated as a *passive market for corporate control*. In most continental European countries political and business leaders collude to prevent large firms from being treated as disposable assets. This approach is based on an argument that hostile takeovers are a negative aspect of poorly regulated capitalism and that the conquered firms are open to being ransacked, reorganized, or even liquidated, with grim consequences for employees and communities. Awareness of this argument has often allowed the management of target firms in Continental Europe to mobilize enough political support to neutralize any attempt of hostile takeover.

The successful takeover bid by Mittal Steel (a company that had overtaken in 2005 Arcelor to become the number one steel producer in the world) for Arcelor in 2006 is a landmark in many respects. The takeover illustrates the changes in governance, market for corporate control, and the mechanisms for hostile takeovers that have occurred in the last decade in Continental Europe, motivated by strong shareholder activism. Arcelor was a typical Central European firm with strong ties to local government, which supported management in detriment to the shareholders' return. The excuse given for this was that the economic and social importance of the company as employer and its contribution to the country's economy was more important than increasing value for shareholders.

On January 27, 2006, Mittal Steel made its hostile takeover bid for Arcelor with a 18.6 billion euro (cash-and-share offer for Arcelor. The offer valued Arcelor's shares at 28.21 euros per share, a 27% premium on its close the night before the bid. Two days later, on January 29, 2006, Arcelor's board rejected the offer. On May 10, 2006, Mittal Steel raised its offer to 20.7 billion euros. On May 17, 2006, Mittal Steel raised the offer again by 34% to 25.8 billion euros, with a 57% increase in the cash component. The new offer relinquished the Mittal family's control of the combined group, as the family's share would be reduced from 88% to just 43.5%. In spite of the rich premium, management of Arcelor instead proposed a merger with an obscure Russian steel company. After additional shareholder protests and calls to destitute the board members and management, the Arcelor board finally ceded to shareholder's pressure and accepted the Mittal Steel offer of 26.9 billion euros.

The hostile takeover of Arcelor by Mittal Steel also reflects the changes in terms of governance, market for corporate control, and the mechanism for hostile takeovers, that had occurred in Europe throughout the last decade. These changes were mainly motivated by growing shareholder activism, led by institutional investors and hedge funds that entered the Continental European market during the 1980s and introduced this market to U.S. style shareholder activism. Lawmakers responded, and took various steps to reduce protectionism of local firms and increase shareholder's power vis-à-vis management and dominant shareholders.

Also, it provides further evident that mergers and acquisitions (particularly hostile deals) were consistently increasing target shareholders' gains. This created a market for corporate control, where firms that did not give the best return to their shareholders could replace their management with more competent management from another firm. This was the case of Arcelor's management (with a poor performance that reflected in P/E of 4), who was replaced by Mittal Steel's management (which had a better performance that reflected in a P/E of 5). The decisive factor for analysts and investors, in all likelihood, was that Mittal Steel's management could better take advantage of the synergies of the combined firm and eventually reach the same P/E level of other steel firms (which were in the 8–9 P/E range). This was a huge windfall for Arcelor shareholders, who received a 43% price increase for their shares out of the deal.

The potential of the combined firms, the financial market boom, the availability of low cost financing, and the substantial fees, were probably the decisive factors that motivated the investment banks to promote the hostile takeover of Arcelor by Mittal Steel.

A Comparison of Corporate Loan Pricing at Domestic and Foreign Banks

Chien-Chih Peng^{*}

Abstract

As the world becomes more globalized, banking firms face increased competition. To survive from intense competition, banks have to focus on operation efficiency and cost effective measures so as to maximize profits. Since lending is the primary business for banks, the price banks charge on corporate loans has been a popular research topic. Corporate borrowers seek loans with the lowest price. However, is there any difference for corporations borrowing money between domestic (U.S.) banks and foreign banks? This paper examines whether domestic and foreign banks price corporate loans differently.

Research studies on corporate loans have focused on how various variables such as loan contract terms, borrower and lender characteristics, and geographical regions affect the loan pricing. The difference in loan pricing between domestic and foreign banks can be generally explained by regulation, asymmetric information, home bias theory, and introduction of Euro. McCauley and Seth (1992) argue that the difference in capital ratio regulations imposed on banks around the world can affect how banks charge on corporate loans.

Carey and Nini (2007) argue that asymmetric information can attribute to the difference in loan pricing when lenders do not have access to the same information or the cost of receiving the information is much higher for one set of lenders compared to another. Therefore, lenders' risk-evaluation of a borrower will diverge and so will the spread that the borrower is charged. If the access to information depends on the home nation of the lender and borrower, the result could be loan-pricing differences among domestic and foreign banks.

The home bias theory could explain why loan pricing at domestic and foreign banks are not equal. Home bias appears when borrowers choose to issue in their own corporate loan market. It has been found that borrowers located in places where a major corporate loan market exist preferably issue there instead of abroad. In absence of a major corporate loan market at home, borrowers tend to issue in Europe. The home bias theory suggests that the loan market is segmented, thus there are additional costs involved when choosing to issue outside one's home market. A segmented market allows for pricing discrepancies to persist in the long run.

Santos and Tsatsaronis (2003) find that the introduction of the Euro in January 1999 can affect the loan pricing in the European market. The Euro created a more homogeneous market resulting in increased competition among lenders in the European market. Increased competition along with lenders' ability to gain from economies of scale benefitted the borrowers, whose borrowing costs decreased. In effect, the Euro can be one of the underlying reasons for loan pricing discrepancies between U.S. and foreign banks, since the European market plays a major role in the foreign financial market.

I collect corporate loan data from Loan Pricing Corporation's Dealscan Database for the period from 1996 to 2000. There were 6,985 observations from domestic banks and 4,440 from foreign banks. Of the loans provided by domestic banks, 3,011 loans were drawn by credit-rated borrowers whereas of the loans provided by foreign banks, 2,313 loans were drawn by credit-rated borrowers.

The results indicate that there is no significance difference in the pricing of corporate loans at domestic (U.S.) and foreign banks when a borrower has a credit rating. The insignificance suggests that

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information associated with the borrower is clear. However, when including both rated and not rated borrowers foreign banks price their corporate loans about four basis points less than domestic banks. The difference suggests that U.S. banks have less risk acceptance than their foreign counterparts.

Day-of-the-Week Effect and January Effect Examined in Sweet Crude Oil

Raj Kohli

This study examined the day-of-the-week effect and January Effect in the crude oil returns for the period March 30th 1983 through October 12th 2012. The results of this study indicate the presence of the day-of-the-week effect in Crude Oil Markets. The results of this study also indicate that there may be a daily seasonality in the variance of oil returns. However, the findings of this study shows that January effect in the crude oil market does not exist in the mean returns or variance.

Day-of-the-week effect/January effect in Gold and Silver Markets

Precious metals (Gold, Silver and platinum) possess similar characteristics to money and medium of exchange and unit value (Goldman, 1956; Solt and Swanson, 1981; Dooley, Israd and Taylor, 1995). Lucey and Tully (2006) examined daily seasonality in the conditional and unconditional mean and variance of daily Gold and Silver contracts over the 1982–2002 periods. Blose and Gondhalekar (2012) examined the Gold market for the period 1975 through 2011. Baur (2013) investigated monthly seasonal in Gold returns for each month from 1980 to 2010 and report that September and November are the only months with positive and statistically significant Gold price changes.

The current study examines two calendar related seasonal anomalies (*Day-of-the-week effect and January effect*) in Sweet Crude Oil Markets.

Data and Methodology

The daily and monthly closing price data for Sweet Crude Oil are collected for the period March 30th 1983 through October 12th, 2012. The daily closing price is used to analyze day-of-the-week effect while monthly closing price is used to examine the January Effect in the above commodities. Regression methodology, commonly used for examining seasonal anomalies in equity markets is used for analyzing calendar related anomalies in crude oil markets.

Results

The results of the *Day-of-the-week effect* above analysis are reported in Tables 1, 2 and 5. Basic statistics shown in Table 1 indicate that the oil returns are negative on Monday and Tuesday; and positive on all other week days.

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Standard deviations of returns for Monday to Friday are 0.0258451, 0.0230691, 0.0242866, 0.0235518, and 0.0200302 respectively. Monday crude oil returns have the second highest Kurtosis and highest skewness.

Table 2 shows the regression results for weekend effect in crude oil returns. For example, Mondays' mean daily oil returns are -.000351 with p-value of 0.557, suggesting a probability of 55.7% that the mean daily oil returns on Monday are statistically zero. Similarly, mean daily returns on Tuesday, Wednesday, Thursday and Friday are -0.000596 (p-value 0.31), 0.000978 (p-value 0.10), 0.000939 (p-value 0.11), and 0.001156 (p-value 0.053) respectively. Overall F-value of the regression is 2.046 with significance level of 0.069 indicating that mean daily oil returns for different days of the week are statistically different from each other. The analysis reported in Table 2 indicates presence of the day-of-the-week effect in crude oil returns.

The results of *January Effect* for Crude oil are reported in Tables 3 to 5. Basic statistics shown in Table 3 indicate negative monthly returns on crude oil for February (-0.006848, skewness -1.690); March (-0.000255, skewness -0.812), November (-0.016436, skewness -0.979); and December (-0.025498, skewness -0.368). While the remaining eight months of the year have positive returns and the average monthly crude oil return in April is the highest,

Table 4 shows the regression results for January effect in crude oil markets. The mean monthly return for April (0.041150) is significant at 5 percent while mean monthly return for May (0.033424) is significant at 10 percent. The overall F-value of 1.323 (p-value 0.203) shows absence of the January effect in oil markets. The monthly returns for April and May are statistically positive, while mean returns for other months of the year are statistically insignificant. The results do not support presence of the January Effect in crude oil return during the analysis period.

Conclusion

The analysis of the daily returns in Crude oil markets shows presence of day-of-the-week effect in crude oil markets. The mean daily returns in crude oil are significantly positive for Friday which is consistent with the common day-of-the-week effect in equity markets. Monday's daily return in crude oil is negative but statistically insignificant. The results of this study does not support presence of January effect in crude oil markets. The findings of this study indicate that there is no seasonality in monthly variance of crude oil.

Tables and References are available upon request.

Do Chinese Banks Perform Better after IPOs?

Haiyan Yin*, Jiawen Yang** and Jamshid Mehran***

China's banking industry has gone through significant reforms in the past two decades. The industry has transformed from a monopoly of state-owned banks to a spectrum of banks with different sizes, regional orientation, and ownership structure. As part of the banking reform, major commercial banks in China went through initial public offering (IPO) in the past two decades. Has this change in the ownership structure led to improvement in their performance? With a comprehensive dataset of Chinese banks over 1999-2010, we investigate the effects of IPO on bank performance in China. We measure bank performance with technical efficiency score and technical efficiency rank that are estimated with stochastic frontier approach (SFA) and production function. With the method developed by Berger et al. (2005), we find that banks that are selected for public listing are significantly more efficient than others that are not (selection effect). But we fail to find dynamic effect, i.e., IPO banks do not gain efficiency after going public, either in the short run or the long run.

Although regression analysis finds no significant efficiency change after IPO, it does not provide detailed bank performance information around the IPO year. By further looking into the performance of IPO banks and their matched industry counterparts based on bank size and ownership characteristic year by year, we find that IPO banks significantly outperform their industry counterparts in the year prior to IPO, but underperformed the control banks for the three of the four years immediately after IPO. The most pronounced decline in performance is from the year prior to IPO (Year -1) to the year of IPO (Year 0). This provides additional evidence of window-dressing hypothesis, which states that IPO firms attempt to window dress their accounting numbers before IPO and manipulate investors' expectations to attract more investors and sell the stocks at higher prices. The superior performance prior to IPO is also consistent with the timing hypothesis, which argues that IPO firms might time their public offerings to coincide with the time when their performance is extremely good but not sustainable. The poor performance at the year of IPO could be explained by the fact that some of the one-time expenses associated with IPO are incurred in the year of IPO which adversely affect their performance. For the three years after IPO, we do not see significant difference between IPO banks and their industry counterparts. Although none of the three years following IPO has seen efficiency higher than their pre-IPO level, we do see efficiency gain compared to the year of IPO. Due to the sample limitations, we cannot show the long-run performance of IPO banks, but at least the gradually increasing efficiency for the three years following IPO is consistent to the conjecture that bank performance may turn around after several years because the costly restructuring may lead to a temporary increase in costs or reduction in profits in early years following IPO.

This study provides additional evidence of post-IPO bank performance, which is understudied in the literature. Although we find similar results to some of the studies in the literature about selection effects and dynamic effects (e.g. Lin and Zhang (2009)), our study shows more evidence on the performance around IPO year. That is, although in general, IPO banks do not gain efficiency after IPO, they do lose efficiency for the three years subsequent to IPO. To the best of our knowledge, this is the first study that addresses the performance of IPO banks in China after 2005. As 11 (68%) of the IPO banks, especially the most important offerings of Big Four, were listed after 2005, our coverage is much broader than the existing studies. We use a different measure of bank efficiency than the existing studies on Chinese banks. Lin and Zhang (2009) only use simple financial ratios to measure bank performance. Although Jiang et al. (2009) also focuses on bank efficiency, the method we use in this study is different from their measurement of efficiency and we observe different evidence.

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References:

Berger, A., Clarke, G.R.G., Cull, R., Klapper, L., Udell, G.F., 2005. Corporate governance and bank performance: A joint analysis of the static, selection, and dynamic effects of domestic, foreign, and state ownership. *Journal of Banking and Finance*, 29, 2179-2221.

Jiang, Chunxia, Shujie Yao and Zongyi Zhang, 2009. The effects of governance changes on bank efficiency in China: A stochastic distance function approach. *China Economic Review* 20, 717-731.

Lin, Xiaochi and Yi Zhang, 2009. Bank ownership reform and bank performance in China, *Journal of Banking & Finance* 33, 20-29.

Does Asymmetric Risk Matter?

Stephen P. Huffman* and **Cliff R. Moll****

We investigate the relationship between future monthly returns and measures of risk over the 1991-2009 period for a sample of individual firms. Motivated by the mixed empirical results in prior research related to downside and upside risk and the limited amount of empirical research on upside risk, we simultaneously model both upside and downside risk to test for asymmetries in the relation between risk and return.

We employ a Fama and MacBeth methodology where we average the monthly cross-sectional coefficient estimates across time and test for statistical significance. Given that each of the risk variables is a measure of volatility, we expect positive coefficients on each of the risk measures, which is consistent with the positive risk-return relation expected under traditional capital market theories. Using an orthogonalized measure of downside risk, we simultaneously model both upside and downside. Our orthogonalized measure of downside risk can be thought of as the downside risk for a firm that is independent of (unexplained by) upside risk. As such, the orthogonalization of downside risk reduces the impact of multicollinearity in our predictive models.

When orthogonalized relative to upside risk, downside risk is priced in our full sample model, while upside risk is not. However, when we partition the sample into size and B/M quintiles, we find a positive relationship between future returns and both downside and upside risk is present only in the smallest size quintile and in the extreme value quintile (i.e., firms with the highest book-value to market-value ratios). Therefore, the pricing of asymmetric risk measures is not generalizable and varies with firm size and value measures. Our results contribute to resolving the volatility anomaly.

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OFFirm-Specific Determinants of Nominal Stock Return Risk: New Evidence with Industry Data

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Abstract

We investigate the determinants of nominal stock return risk using disaggregate industry data. Employing a microeconomic approach, we test if nominal stock return risk is influenced by the covariance between financial distress and expected inflation and examine how this covariance is related to the interactions between expected inflation and firm-specific variables of leverage, market to book ratio and cash to asset ratio.

Our key hypotheses are (1) that a standard Fisher effect influences nominal stock returns; and (2) that nominal stock return risk co-moves with expected inflation. We argue that this co-movement is partly microeconomic in origin and is due specifically to the interaction between expected inflation and various accounting and market measures of corporate activities.

Our sample includes non-financial firms listed on the NYSE, AMEX, NASDAQ, and ARCA, which we classify into forty-eight industry portfolios, over the 1974Q4 to 2011Q3 period. Employing industry-level nominal stock returns, we find various degrees of support for the two hypotheses, depending on the particular statistical approach used for assessment purpose.

Using OLS regression models to estimate the individual responses of each industry portfolio, our results offer strong statistical support for the effect of the interaction of a firm's market to book ratio and expected inflation on nominal stock return risk. Our results, however, show weak or little empirical support for the Fisher hypothesis itself or for the other two hypothesized influences on nominal stock return risk that operate interactively through leverage and the cash to asset ratio despite the positive coefficients for expected inflation in thirty-five industries and for the leverage interaction in thirty-two industries.

Interestingly, the regression results based on two sub-periods of high and low inflation show that stronger nominal stock return relations are found during the high inflation period of 1974Q4 to 1991Q1 than during the low inflation period of 1991Q2 to 2011Q3.

As a robustness test and as a way to obtain more broadly applicable evidence, we also perform the non-parametric Wilcoxon signed rank test, which evaluates the industry regression evidence from a more encompassing perspective. In contrast to the OLS results, the non-parametric test for the median t-value provides support for various parts of the two hypotheses. The test results are consistent with a significantly positive Fisher effect, and the interaction between expected inflation and leverage is estimated to significantly impact nominal stock return risk.

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The overall results of our paper provide empirical evidence that the interaction between the firm's market to book ratio and expected inflation reduces the nominal risk premium, whereas the interaction between leverage and expected inflation increases the risk premium.

Since these findings occur within the context of an empirical model that includes terms for the nominal risk premium, the common omission of these terms in the literature is an obvious misspecification in formulating and conducting tests of the Fisher hypothesis. As Boudoukh et al. (1994) and Pilotte (2003) argue, our results suggest that microeconomic factors must be added to the macroeconomic influence in order to gain a deeper understanding of nominal stock return risk.

Impact of the 2008-2009 Recession on Minority-Owned U.S. Banks

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 Mussie Teclezion^{***}

Abstract

This study is an outgrowth of previous research by Lepley and Nagy (“Native American Banks: Overview and Recent Performance,” *The Journal of Finance Issues*, 2012). Lepley and Nagy examined the financial performance of Native American commercial banks in the U.S. In the current study, we broadened the range of minority-owned banks, adding the following ownership categories: African-American, Latino, Asian-American, and Women. We employed a variety of classic bank performance measures to compare these institutions over the period 2002 through 2011. The performance measures include: return on assets, non-current loans/total loans, interest income/average assets, interest expense/average assets, net interest income/average assets, provision for loan loss/average assets, non-interest income/average assets, non-interest expense/average assets, average earning assets/average total assets, net loans & leases/average assets, and tier 1 capital/total assets.

The total minority bank sample ranged from as few as 85 commercial banks (in 2002) to 100 such banks in 2011. As noted in the table immediately below, there were vastly different numbers in the five different minority bank categories. Also, note that the Asian-American group experienced tremendous growth over this time period. Additionally, although not displayed in the table below, the Asian-American growth was concentrated in the period 2005 through 2007, right on the doorstep of the 2008-09 recession.

Number of Commercial Banks by Minority Ownership Category					
Year	African-Amer.	Women	Latino	Asian-Amer.	Native Amer.
2002	23	7	11	29	15
2011	23	7	14	40	16

We conducted an analysis of variance, year by year, of our performance measures—aimed at detecting any significant differences among the different minority ownership categories. Some of the more notable performance comparison results are summarized below.

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Non-Current Loans / Total Loans: African-American banks consistently and significantly differed, in an unfavorable manner, from other minority banks in their Non-Current Loans / Total Loans ratio in nine of the ten years examined.

Interest Expense / Average Assets: Interestingly, African-American banks had the lowest borrowing costs among minority banks, in some cases holding as much as a 40 basis point advantage. The differences were significant in 6 of the ten years examined.

Non-Interest Overhead / Average Assets: African-American banks consistently had the highest non-interest overhead expense relative to average assets. The differences were significant in 7 of the ten years examined and in some years these banks were at as much as a 150 basis point disadvantage to other minority banks.

Average Earning Assets / Average Assets: Native American banks had significantly lower average earning assets relative to average assets than other minority banks in eight of the ten years examined.

Net Loans and Leases / Average Assets: Ownership categories of minority banks differed significantly in net loans and leases to average assets in eight of the ten years examined. African-American banks had the lowest relative loan activity in most of these years where significance was found.

Tier I Capital / Average Assets: Differences among minority banks have been consistently and significantly different since the financial crisis of 2008. Differences prior to 2008 were unremarkable. Bank capital took a massive hit in 2008-2009. Women-owned, Latino, Asian, and Native American banks have shown hesitant signs of recovery in this measure since 2008. However, strengthening of capital positions is not evident among African-American banks since 2008. This is due in no small part to the massive loan write-offs African-American banks continue to experience.

Net Income/ Total Assets (ROA): Of the five minority categories, the *women-owned* bank group was the only one achieving a positive ROA throughout the entire 2002-2011 period. Of course, this group is comprised of just seven banks. But it's also notable that the group turned in the *highest* average ROA in *each year* from 2006 through 2009—which included the deepest point of the recessionary period.

Is it a Good Investment Strategy to Invest in Malcolm Baldrige Award Winners?: An Update

Thomas M. Krueger* and Mark A. Wrolstad**

Introduction

In a world of uncertain returns, investors consider risk. Lower risk is often ascribed to investments with higher quality. Firm quality, however, is difficult to quantify. One of the most exclusive management quality distinctions is the Malcolm Baldrige National Quality Award (MBNQA). Since 1988, only thirty-one MBNQAs have been awarded to publicly-held corporations, and frequently to small fractions of an entire firm. This report explains the MBNQA and reports on the share price performance of MBNQA winners.

Literature Review

In their 1997 paper, Krueger and Wrolstad investigated whether companies who adopted the Total Quality Management (TQM) chain reaction paradigm might also have superior financial performance over time.[1] In their portfolio of the 14 publically traded companies given the MBNQA from the beginning in 1988 until 1995, they assumed an investment of \$1,000 in each company on the day of the public award announcement. For comparison purposes, they constructed a similar portfolio that assumed an equal investment in each individual firm's industry index. They found that by 1995 the award-winner portfolio outperformed their industry index based portfolio for a terminal value of \$31,000 vs. \$30,000 and significantly outperformed the S&P 500 index based portfolio for a terminal value of \$31,000 vs. \$6,000. Other findings by Krueger and Wrolstad were that MBNQA winners tended to have more risk, whether measured as total or systematic risk. When they considered portfolio performance using the Sharpe Measure, the Baldrige portfolio under-performed the S&P 500 market portfolio with a risk-adjusted monthly return of 0.153 versus 0.169. As they examined portfolio performance using the Treynor Measure, they found that the Baldrige portfolio outperformed the S&P 500 with risk-adjusted monthly returns of 0.71 versus 0.56 for the S&P 500 Index. An additional finding of the study was that whole-firm winners tended to outperform firms that had only divisions within them that had won the award. The average monthly return of whole-firm winners was 2.31% versus 1.21% for divisional winner firms

Research Method

Performance in this study will be compared to the Standard & Poor's 500 Index. Unadjusted and beta-adjusted returns will be reported. Instead of benchmarking against matched

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firms or industry indexes, this study will benchmark performance of MBNQA winners against themselves. Specifically, we look at the time periods before and after winning the award to determine whether the applicant firms were able to use the MBNQA process and resultant TQM techniques to enhance shareholder wealth.

To analyze corporate performance, we studied three sets of data. The “All Firms” section assumes that firms with divisional winners were positively impacted by having at least some part of their corporation implementing TQM methods. The second section referred to as “Weighted firms” is based upon a weighting of share price returns by the percentage of the firm receiving the MBNQA. Finally, the “Entire Firms” section looks at the whole firm winners.

The tables in this paper show returns during the five year period before winning the award, the first year after receiving the award, and the first five years after receiving the award. Average returns were calculated and median returns were shown. The third performance measure calculated is the z-test statistic which reveals whether the portfolio’s return is significantly different from zero. The fourth performance measure showed the results of t-tests that assess whether the annualized post-award returns are significantly different from the pre-award returns. One comparison is made between the performance before the award and the first year afterward. The second comparison is between the performance before the award and the five years after winning the MBNQA.

Conclusion

We found that equally-weighted MBNQA winners had positive unadjusted returns that were significantly different from zero both before and after winning the awards. The award winners also had positive returns that were significantly different from zero when adjustment was made for the percentage of the firm winning the award. Whole firm award winners were found to have significantly higher returns over the post-award five-year period. When looking at risk-adjusted market excess returns, the all-firms, weighted-firms, and “whole-firm” portfolios all showed significantly better performance in the five year period after winning the award.

Winning the MBNQA is well-publicized evidence of successful efforts taken to enhance the quality of the management processes within the recipient firm. Share price performance of MBNQA winners rises after award announcement. In fact, in over half of the observed portfolios studied, significant raw or risk-adjusted market excess returns were present. Therefore, it appears as though investors positively reacted to the superior managerial skills and efforts of the MBNQA winners. Further study may want to look into benefits of investing in MBNQA winners over even longer post-award periods or search for other factors driving recent limited participation in the MBNQA competition.

References

- [1] Krueger, Thomas M and Mark A. Wrolstad, “Is It A Good Investment Strategy to Invest in Baldrige Award Winners?”, *Midwest Review of Finance and Insurance*, Vol. 11, No. 1, Spring 1997, pp. 153-162

Logistic Regression, Cash Flow Measures and Prediction of Business Failure
Dr. Shyam B. Bhandari*

Introduction The technique most frequently used for predicting business failure is multiple discriminant analysis (MDA). Most of these studies used predictor variables (financial ratios) derived mostly from accrual accounting based financial statement, namely balance sheet and income statement. Very few studies used data drawn from cash flow statement (CFS). MDA assumes that predictor variables are normally distributed. The other technique tried by a few researchers is logistic regression analysis (LRA). The LRA does not assume normality.

The purpose of this paper is to use LRA to construct a failure prediction model. The uniqueness of this study lies in: First, the sample companies are not industry specific; they come from more than 25 different industries, thus implying generic nature of our model. Second, the predictor variables (financial ratios) we selected are logically justified; these are not an outcome of step-wise procedure or so called “brute empiricism” approach. Third, most of the predictor variables will use cash related information from the cash flow statement (CFS). Fourth, all the failed firms in our test sample are from the most recent, 2008-2010 period.

Literature Review Both univariate and multivariate techniques have been used to predict business failure for more than forty years. This effort has been replicated in many countries. Although discriminant analysis was most widely used technique, Logit analysis was used by Zavgren and Friedman (1988), Aziz et al (1988), Gilbert et al (1990), and Laitinen, (1994). A few attempts to use cash flow based data to build failure prediction are due to Aziz (1988), Emel (1997), Rujoub et al (1995), Abdul Aziz (1989), Cornelius (1985), and Gombolia et al (1987). Siegel and Akel (1989) and Sharma (2001) reviewed articles which used cash flow based measures to predict business failure. Sharma concluded that “Despite numerous failure prediction studies investigating the ability of cash flow information to predict corporate failure, their results are mixed and hence inconclusive...”

The Model Logistic Regression analysis (LRA) was used to construct a failure prediction model. LRA is a technique by means of which multiple measurements are reduced to a single weighted composite score, z_i which not only distinguishes between members of two groups but also estimates probability of belonging to one group or other. Mathematically, LRA obtains coefficients (a_i s) of predictor variables (x_i s) in a linear equation.

$\ln(p_i/1-p_i) = z_i = a_0 + a_1x_1 + a_2x_2 + \dots + a_nx_n$ which minimizes error sum of square, The predicted probability of failure ‘ p_i ’ is then $p_i = e^{z_i} / 1 + e^{z_i}$ where e is the base of natural logarithm system and z_i is the predicted (logistic) regression score.

Data We used COMPUSTAT database’s list of “inactive” firms to select approximately 50 “failed” firms from 2008-2010 period. Each of these firms were matched with a “nonfailed” or active firm which belonged to the same Standard Industrial Classification (SIC) code and size (either sales or total asset). Financial statement data for the year prior to inactive year were pulled from COMPUSTAT database. We pro-actively selected cash flow based predictor or explanatory variables to construct the logistic regression model. The idea is to select predictor variables justified by theory rather than milking for them by churning data. Five cash flow measures used as predictor variables are as follows:

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- 1) Operating cash flow divided by current liabilities (OCF/CL)
- 2) Cash flow coverage of interest (OCF + INT + TAX / INT)
- 3) Operating cash flow margin (OCF/SALES)
- 4) Operating cash flow return on total assets (OCF/ASSETS)
- 5) Earning Quality (EBIT/OCF)

Results and Analysis The SPSS-19 software was used to perform analysis. Table I present coefficients (B) of the logit regression model. Wald's Chi-square statistics tests the unique contribution of each variable. Exp(B) is known as odds ratio. The value 4.787 for OCF/CL ratio means that odds of this ratio to predict business failure are 4.787 times better than predicting non-failure. Omnibus test of model coefficients is significant at 0.000 level (chi-square=35.664 for df =5). Table II summarizes classification results for the valid 85 cases in the test sample. The results are very impressive. The model correctly classified 90.9% failed (F=0) and 85.4% non-failed (N=0) companies. The overall classification accuracy is 88.2%.

Table I Variables in the Equation

	B	S.E.	Wald	df	Sig.	Exp(B)
OCF/CL	1.566	.835	3.520	1	.061	4.787
(OCF+INT+TAX)/INT	.043	.033	1.667	1	.197	1.044
OCF/SALE	-.034	.085	.160	1	.689	.967
OCF/ASSET	.898	1.634	.302	1	.583	2.455
EBIT/OCF	.112	.091	1.505	1	.220	1.118
Constant	-.836	.349	5.727	1	.017	.433

Table II Classification Table^a

Observed	Predicted		
	0	1	Percentage Correct
F=0, N=1	40	4	90.9
	6	35	85.4
Overall Percentage			88.2

a. The cut value is .500

Bibliography

- Aziz, Abdul, Barnes, Paul. 1987. The Analysis and Use of Financial Ratios: A Review Article. *Journal of Business Finance & Accounting* 14. No. 4 (January 1): 449.
- Bhandari, Shyam B. 2003, "Pedagogical Issues Concerning Analysis of Cash Flow Statement." *Journal of Financial Education*, 147-156.
- Emanuel, David C., and Lawson, Gerald H. 1988. Bankruptcy Prediction - An Investigation of Cash Flow Based Models. *The Journal of Management Studies* 25, no. 5, (September 1): 419.
- Laitinen, E.K., 1994, "Traditional Versus Operating Cash Flow in Failure Prediction," *Journal of Business Finance and Accounting*, Vol. 21, No.2, 195-217
- Rujoub, Mohamed A.; Cook, Doris M. and Hay, Leon E., 1995, "Using Cash Flow Ratios to Predict Business Failures," *Journal of Managerial Issues*, 75-89.
- Sharma, Dinesh, 2001. "The Role of Cash Flow Information in Predicting Corporate Failure: The Stat of the Literature," *Managerial Finance*, 3-28.
- Siegel, Joel G. and Akel, Anthony, 1989, "A Financial Analysis and Evaluation of the Statement of Cash Flows," *The Practical Accountant*, 1989, 71-78.

Market Behavior in "Lucky" Days

Alex Meisami*, Jian Zhang**

ABSTRACT

The finance literature has shown that natural cycles such as lunar cycle have significant impact on market returns. The market returns are also influenced by other natural factors such as rain and shine (Goetzmann and Zhu, 2005), or seasonality (Ho, 1990). Other findings suggest that investors' mood, demeanor, and beliefs influence their investing decisions, thus, producing abnormal gains or losses in the stock market. It is possible that each day, investors from the same culture, nation, or set of beliefs make similar investing decisions, based on their particular beliefs, that would impact the local or the global markets depending on the cumulative amount of capital invested in each market by the investors. For example, Abadir and Spierdijk (2005) show that Ramadan (the Muslims' holy month) and the Chinese New Year could have considerable influence on index returns and trading volumes. They show that Ramadan, for example, contributes an additional 4% to weekly index returns.

Most people, to some degree, believe in the existence of luck. In some cultures, luck is even seen as the most important factor in whether or not a decision will lead to success. In this paper we investigate how investors' belief, that some days are luckier than other days, would affect the local and the possibly the global indices. We choose Hong Kong as our research target for three reasons: First, the long history between mainland China and Hong Kong has resulted in people speaking a variety of rich languages such as Mandarin and Cantonese. In both languages, people associate numbers with different meanings by the pronunciation or properties. For example, number 1 has a similar pronunciation as "want" in Chinese, number 8 has a similar pronunciation as "getting rich" and therefore number 18 represents "want to get rich" (it is read as 1 and 8 rather than 18). Number 2 has a similar pronunciation as "love" in Chinese, so 28 represents "love to get rich". Another "lucky number" is number 9. In Chinese culture, number 9 is the largest integer single-digital number we know, so it embraces the meanings of "unlimited", "the most" and "the longest". In contrast, number 5 is considered unlucky. In both Mandarin and Cantonese, number 5 can be associated with "no", "not have" and similar negative meanings.

Second, people in both regions use two calendars: Gregorian calendar and Lunisolar calendar which is a combination of lunar calendar and solar calendar. The Gregorian calendar is used for daily activities, and the Lunisolar calendar is mostly used for important events such as weddings and main holidays such as the Chinese New Year. In fact, the majority of Chinese parents would remember their children's birthday by "YINLI", which means the Lunisolar calendar in Mandarin Chinese, rather than by the Gregorian calendar. For example, the date of January 2nd 1990 in Gregorian calendar is actually YINLI December 6th 1989 in Lunisolar calendar.

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Third, believing in luck plays a significant role in Chinese culture. Many Chinese believe certain numbers will bring them luck, thus, their everyday decisions is influenced by those numbers. For instance, people pay a premium for a cellphone number that ends with 8 because they believe it will help them get rich. Because of this widespread preference over numbers, we hypothesize that investors in mainland China and Hong Kong expect the stock market to behave differently in different days of a month depending on whether or not a particular day ends with a lucky or unlucky number. The literature has shown significant calendar effects such as January Effect (Mark Haug and Mark Hirschey, 2005) and day-of-the-week effect (Hakan Berument and Halil Kiymaz 2001). However, we are not aware of any research that investigates the effect of perceived “lucky days” on the stock market.

Since Chinese use two different calendars simultaneously, we analyze the stock returns under both calendars. We are primarily interested in the market returns on days ending with, 5, 15, 25, 8, 18, 28, and 9, 19, 29 in both Gregorian and Lunisolar calendar. We use the Hong Kong Hangseng Index (HSI hereafter) as our index of interest because the special attention it receives from investors in Mainland China and Hong Kong. However, in order to compare the results, we also analyze the S&P 500 Index which for the most part attracts a different group of investors than HSI Index.

Overall, our results support our main hypothesis that HSI’s returns are higher for the lunar days considered lucky (days ending with 8 and 9) and lower for the lunar days ending with 5 (as number 5 is considered unlucky). We do not find similar results for the S&P 500 daily returns in the lunar calendar; neither do we find comparable results for days ending with 5, 8, and 9 in the Gregorian calendar.

We are currently investigating whether the significant influence of Chinese culture and capital in countries such as Singapore, Malaysia, and Indonesia has produced similar market reactions to lucky (or unlucky) days. In addition, we are investigating whether the observed market behavior is caused by individual and/or institutional investors.

BIBLIOGRAPHY

Abadir, Karim M. and L. Spierdijk, “Liquidity Constraints and the Demand for Assets: An Application to the Festivity Effect” (2005). Available at SSRN: <http://ssrn.com/abstract=829484> or <http://dx.doi.org/10.2139/ssrn.829484>.

Berument, Hakan, and H. Kiymaz. “The Day of the Week Effect on Stock Market Volatility”. *Journal of Economics and Finance* 25.2 (2001): 181-93.

Goetzmann, William N., and N. Zhu. “Rain or Shine: Where Is the Weather Effect?” *European Financial Management* 11.5 (2005): 559-78.

Haug Mark and M. Hirschey, “The January Effect, Financial Analysts”. *Journal*, vol. 62, no. 5 (2006): 78-88.

Ho, Y. “Stock Return Seasonalities in Asia Pacific Markets”. *Journal of International Financial Management and Accounting*, (1999) 2:47-77.

National Differences in Finance Journal Acceptance Rates

Thomas M. Krueger*

I. Introduction

This report presents the most extensive study of the academic journal review process in the finance discipline. Through numerical and graphic presentations, insights are shown regarding national differences in acceptance rates. Such insight will help researchers target their works and administrators evaluate the relative value of manuscripts in various journals. The table at the end of this abstract is discussed in the following paragraphs. All data is for the 396 finance journals reported during the summer of 2012, in *Cabell's Directory of Publishing Opportunities in Economics and Finance*.

Finance Journal Acceptance Rates

Average finance journal acceptance rates across countries range from 18.8% (China) to 60.7% (Romania). Consideration is given to the whether acceptance rates are different at the 0.05 level of significance. For instance, the distribution of Chinese finance journal and Greek finance journals is sufficiently broad to result in these two countries not having different acceptance rates, although their average rate of return varies by 11.2% (i.e., 30.0% - 18.8%).

Finance journals with the next highest acceptance rates, those published in Australia have an acceptance rate of 30.9%. The distribution of acceptance rates in Australian finance journals are such that they are significantly higher acceptance rates than finance journals published in both China (18.8%) and the Netherlands (19.4%). However, these acceptance rates are not significantly lower than those of finance journal published in the United Kingdom (32.2%).

Canadian finance journals, with an average acceptance rate of 32.9%, are the next most lenient. Both they and the Spanish (39.5%) finance journals are significantly different from the Chinese, Netherlands, and Italian (23.4%) acceptance rate journals. Swiss (23.9%) finance journals have a significantly lower acceptance rate than those published in the United Kingdom (32.2%). The reason the same observation regarding significant differences cannot be made for Canadian (32.9%) finance journals and Spanish (39.5%) finance journals, because there are far fewer Canadian and Spanish finance journals.

Malaysian (40.9%) finance journals have the next highest average acceptance rate. Finance researchers in this nation will find acceptance rates to be significantly higher than those in the United Arab Emirates (24.8%) and all nations with lower acceptance rates.

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Adding in Turkey (42.1%), which has the next highest acceptance rate, truncates the left side of the acceptance rate window at Australia (30.9%). It is possible to conclude that finance journals published in the United Kingdom have a significantly lower acceptance rate than those published in Turkey, without coming to the same conclusion relative to Australia. There is quite a jump in average acceptance rates when India (44.6%) is added to the mix. Finance journals published in this nation are significantly more lenient than those in all nations but Spain (39.5%), Malaysia (40.9%), and Turkey (42.1%). In Croatia (50.0%), half of all journal submissions are accepted. This is significantly higher than Spain (39.5%). The country with the highest average acceptance rates in their finance journals is Romania, with a 60.7 percent average. This is significantly higher than all but Croatian (50.0%) finance journals.

Looking back across Figure I, three solid vertical bars are used to illustrate instances when there is a break in acceptance rates. The three vertical bars highlight the four natural groupings of acceptance rates. It was noted above that Chinese (18.8%) and Netherlands (19.4%) finance journals have a significantly lower acceptance rate than Australian (30.9%) finance journals. Acceptance rates at Australian finance journals are significantly lower than those at edited in India (44.6%), Croatia (50.0%), and Romania (60.7%). Authors should target journals from these various groupings on the basis of whether they perceive their manuscript to be above average, average, or below average.

The Perfect Storm that Destroyed Defined Benefit Pension Plans and the Prospect for Comfortable Retirements

Robert L. Howard* and Jerry Thorne**

Most companies offer some type of retirement plan for their employees, but many do not mainly because of the cost and the lack of a legal obligation to do so. Data published by the Bureau of Labor Statistics in 2005 indicated that 33% of employees at companies with 100 or more employees did not participate in an employer sponsored retirement plan. The situation at small companies was more dismal. In fact, 63% of employees at companies with fewer than 100 employees had no pension plan of any type (Costo 2006). Since small companies account for a major part of the job growth in the US, many of the jobs created in this sector will have little or no retirement benefits.

Companies tend to provide two types of retirement plans: the defined benefit plan and the defined contribution plan. The defined benefit plan provides monthly income based on factors such as the employee's age, number of years employed, and average salary of the highest 3 or 4 years. To be fully funded, there must be sufficient assets in the plan to provide the promised pension benefits; these assets arise from periodic contributions made to the fund by the plan sponsor, as follows:

$$F = \sum_{i=1}^m A_i(1+j)^{-i} \qquad F = \sum_{i=1}^n B_i(1+j)^i$$

where A_i = the pension benefit in period i , m = the life expectancy after retirement, j = the return on the fund's assets, F = the lump sum at retirement necessary to pay the annual retirement benefits, n = the number of years deposits made into the fund, and B_i = the contribution made by the plan sponsor to the fund in period i .

It is the firm's responsibility to make sufficient contributions to the fund so that those contributions, plus the investment earnings on the fund, are sufficient to pay the promised benefits. If the actual value of the fund is less than the amount necessary to pay the promised benefits, the fund is underfunded, and the sponsoring firm must contribute additional monies to the fund to eliminate the underfunding. The risk of providing the promised retirement payments lies with the employer. If the fund performs poorly or if the employee lives longer than expected, the employer must make additional contributions to pay the promised benefit.

In the case of the defined contribution plan, the employer and/or the employee make investments into a retirement fund. The amount of the investments made into the fund and the return on the fund assets determine the monthly benefit received at retirement. As a result, the risk associated with a defined contribution plan is with the employee. If the fund assets are inadequate and/or the fund performs poorly, the employee will have a lower retirement income.

Over the past 30 years there has been a steady decline in the number of firms offering the defined benefit plan (Butrica 2009). What are the factors that have led to the decline in defined benefit plans? There

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are a number of variables influencing pension benefits and costs. These include the term and amount of annual (or monthly) contributions to the retirement fund, the projected return on invested pension fund

assets, the projected inflation rate, the age at retirement, the term and amount of benefit receipts, and whether benefits are indexed to inflation. These variables require companies to make numerous assumptions.

Our results indicate that firms have been overly optimistic with these assumptions, leading to a need to make additional payments to the fund and to increase the pension benefits paid out of the fund. Since these payments come from operating income, net income may be less or losses may occur. Many firms have dropped their defined benefit plans because they were not financially able to eliminate the underfunding of their plans.

The alternative to the defined benefit plan is the defined contribution plan. The 401(k) plan is the defined contribution plan that most firms offer. When 401(k) plans were introduced in 1978, they were initially seen as a supplement to the traditional defined benefit plans corporations were offering. Firms quickly realized that they were cheaper and less risky than the defined benefit plans, and they began changing to defined contribution plans. In fact, defined contribution plans are the only plan offered by many companies today.

What is the prospect of a comfortable retirement based on 401(k) plans for the typical employee? To answer this question, several issues must be considered.

The 401(k) plan offers the employee the opportunity to make a contribution to his plan; the employee may choose to make a contribution, or he may choose not to contribute. The employer may match a portion of the employee's contribution, but there is no legal obligation to do so. In recent years, many firms have reduced or eliminated their matching contribution, and many employees are contributing miniscule amounts to their 401(k) plans. In a survey sponsored by the Employee Benefit Research Institute it was found that 31% of all employees had saved nothing for retirement, and another 21% had accumulated less than \$25,000 for retirement (Employee Benefit 2005).

A survey by Northwestern Mutual revealed that only 6% of employees with 401(k) plans contributed an amount sufficient to qualify for their employer's maximum matching contribution. Some employees have withdrawn funds from their 401(k)s or have borrowed and not repaid the loans. Others have taken lump sum distributions when changing jobs and spent the money rather than reinvesting it (Singletary 2002).

Since a large percentage of 401(k) plans are invested in stock mutual funds, the large run-up in the market during the 1990s made the 401(k) seem like a certain way to wealth for retirement. A substantial number of mutual funds sported ten-year average returns in excess of 15%. Funds that achieved one-year returns of over 100% were widely publicized and their managers were praised for their "investment savvy." Then in 2000, for the first time in history, 401(k) plans on average lost money; the average return was **negative**. Values of 401(k)s were down further in 2001 when 9/11 occurred, propelling a further downward trend; and then thousands of employees saw their 401(k) retirement funds evaporate in the Enron debacle. Balances in 401(k) plans eroded even further in 2002 and 2008-09.

This study supports our conclusion that for a number of reasons, many employees will be disappointed at retirement time because their 401(k) plans turned out to be inadequate. There are several additional factors that might make one question whether the 401(k) is truly a pathway to wealth at retirement. We find that some of these factors are related to plan sponsors, some are related to employee participants, and some are related to economic conditions. These issues are addressed in the expanded version of this paper.

References

Butrica, Barbara A., Howard M. Iams, Karen E. Smith, and Eric J. Toder (2009), “The Disappearing Defined Benefit Pension and Its Potential Impact on the Retirement Incomes of Baby Boomers,” *Social Security Bulletin*, Vol. 69, No. 3 (2009), pp. 1 – 28.

Costo, Stephanie L. (2006), “Trends in Retirement Plan Coverage Over the Last Decade,” *Monthly Labor Review*, Vol. 129, No. 2 (February 2006), pp. 58 – 64.

Employee Benefit Research Institute. Retirement Confidence Survey – 2005 Results (WWW document). URL <http://www.ebri.org/surveys/rcs/2005/>

Singletary, M. “Resolved: To Build a Financial Foundation by Learning to Invest Wisely,” *The Washington Post*, January 3, 2002, p. E03.

Price-to-Earnings and Market-to-Book Metrics in the Practical Application of the Discounted Dividend Theory of Equity Valuation

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ABSTRACT

One of the most difficult tasks that any finance practitioner has is to estimate the intrinsic value of a firm's equity securities. The practitioner can choose from many models. Some are derived from discounted cash flow theory, while others are ad hoc in nature and are less solidly grounded in economic theory. This paper reviews the sound theoretical underpinnings of the P/E and M/B approaches to the equity valuation problem which and illustrates their potential utility as realistic and accessible heuristics for identifying investment opportunities.

The finance literature is well developed on the question of valuing securities. The Dividend Discount Model (DDM) serves as a generally accepted theoretical standard for equity valuation. In essence, a security is worth the summation of the cash flows it can be expected to spawn, manifested as future cash dividends, and each discounted to its present value. If this intrinsic value is greater than the issue's current market price, the stock is deemed to be cheap and considered by the value investor to be a candidate for purchase. Conversely, if the intrinsic estimate is less than the market price, the stock is deemed rich and will be numbered among the investor's candidates for sale.

The appeal of a simplified DDM as a fundamental screening tool motivates efforts to identify useful heuristics for its application. In this paper we examine two familiar financial ratios, the price-to-earnings or P/E ratio and the market-to-book or M/B ratio, to the DDM framework and underscore their value as accessible vehicles for the practical application of a discounted dividend valuation paradigm.

PRESENT VALUE ANALYSIS OR DDM

The Dividend Discount Model or DDM) can be found in most if not all beginning corporate finance books. It can be written as follows:

$$P_t = \frac{D_{t+1}}{k-g} = \frac{(b) \cdot E_{t+1}}{k-g} \quad (1)$$

With the usual assumptions for the model, it can be shown that equation (1) can become an equation for the price earnings multiple. :

$$\frac{P_t}{E_{t+1}} = \frac{b}{k-ROE \cdot (1-b)} \quad (2)$$

Further manipulation of equation one yields:

$$\frac{P_t}{BV_t} \cdot \frac{1}{ROE} = \frac{b}{k-ROE \cdot (1-b)} = \frac{P_t}{E_{t+1}} \quad (3)$$

Many finance textbooks use the price earnings multiple and multiply this number by the expected earnings to arrive at an estimate of the intrinsic for the equity security.

In practice, the firm's actual $\frac{P_t}{E_{t+1}}$ is not available because the actual future earnings per share are not known; only estimates of the earnings are available. One approach used by practitioners to obviate this problem is to use the average $\frac{P_t}{E_{t+1}}$ for the firm's market segment and multiply this by the firm's expected earnings. Another approach would be to average several analysts' estimates of $\frac{P_t}{E_{t+1}}$ for the firm and multiply this by your estimate of expected earnings.

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Still another approach would be to use the $\frac{P_t}{E_t}$ multiple and multiply this by the expected earnings. An extension of this procedure is outlined next.

Equation (4) shows that the problematic $\frac{P_t}{E_{t+1}}$ can be replaced by $\frac{P_t}{BV_t} * \frac{1}{ROE}$, a multiple comprised of current numbers. Equation (12) demonstrates an approach that algebraically gives the same result as the $\frac{P_t}{E_{t+1}} * E_{t+1}$ approach.

$$\frac{P_t}{BV_t} * \frac{1}{ROE} * E_{t+1} = \frac{b}{k - ROE * (1 - b)} * E_{t+1} = \text{expected Price.} \quad (4)$$

CONCLUSION

Equations (2) or (4) can be multiplied by earnings to calculate expected stock price. Most if not all current corporate finance and investment books use the first part of equation (2) and multiply this by an estimate for earnings to estimate the intrinsic value. The strength of Using equation (4) is that it only requires next period's earnings, the current return on equity (ROE), and the most recent price to book value ratio.

There is no requirement for another model to determine the discount rate. Using a market determined discount rate reflects the company's growth potential is imbedded in P/E and P/BV. Given the empirical problem with CAPM, this may be the only viable present value model.

Dechow, Sloan, and Soliman (04) cite earlier studies that show that in the long run the required rate of return (k) mean reverts to the ROE. If this is the case, a viable proxy for k is the ROE. Substituting ROE into the above equations causes the following:

$$\frac{P_t}{BV_t} = \frac{b * ROE}{k - ROE * (1 - b)} = 1, \quad (5)$$

$$\frac{P_t}{BV_t} * \frac{1}{ROE} = \frac{1}{ROE} = \frac{P_t}{E_{t+1}}, \quad (6)$$

and:

$$\frac{1}{ROE} * E_{t+1} = \text{Expected Price.} \quad (7)$$

If one is willing to make the case that ROE is as good as any other estimate for the required rate of return, then price analysis is indeed a very simple exercise.

Retirement in the US: Golden Years or Shifting Sands?

Kumoli Ramakrishnan*

ABSTRACT

The post *Great Recession* period saw the US (*and several other countries*) populations enduring major reduction in the standard of living, a result of a confluence of some unfortunate and unforeseen events

1. The housing market collapse that rendered more than 40% of the houses *under water* i.e. mortgage balances exceeding the collapsed market value of the homes (for most individuals the largest asset they owned).
2. The equity market collapse that wiped out over two trillion dollars value in the investment and individual retirement accounts, and
3. The very high job losses and prolonged periods of joblessness resulting in a spike in bankruptcy, erosion of job skills (*the hysteresis hypothesis*) and almost one in two persons in the *poor or low-income* group as per the Census data! (Yen, Hope Dec 2011).

The net worth erosion combined with total loss of income for a large number of workers ravaged balance sheets of households. Student Loan balances (*which can't be shaken off even by going through bankruptcy*) now exceed credit card balances for the country as a whole. Slim, though improving, job prospects for many young entrants in the workforce have resulted in increasing numbers of households in which multiple generations co-habit! More seniors are working today than before the recession of 2007-09 and majority of adults indicate that they plan to work past 65 years. 'Median net worth for pre-retirement households reverted to its lowest level since 1998' (Bryson, Jay H, et al. Oct 2012)

During the last century, the US managed to decouple the age-old link of advanced age with poverty, with highly successful programs like Social Security and Medicare. For most individuals getting old did not mean hunger and deprivation. Families likewise were spared significant economic burdens in caring for the old. The post-working period came to be known as the 'Golden Years' when one could relax awhile and enjoy the fruits of lifelong labor. Defined benefit (DB) programs were the norm for pension plans, when, depending on the tenure of one's working life, deferred compensation arrangements ensured income for life. The onus of providing for such payments remained with the employers, who were expected to fund the retirement / pension obligations of their workforce. Since the 1980s defined benefits (DB) programs increasingly were converted to defined contributions (DC), especially in the private sector as firms shed their responsibility for retiree benefits and shifted the burden of managing the risk – (*fluctuating returns on the pensions' contributions' investments as well as the higher expenses due to increasing lifespan of the population*) – on to individuals. Other employers froze pension plans (Munnell 2007) or dumped their retirees into the public Medicare program to cut costs.

The shift to DC retirement programs is troublesome for many as individuals do not have and cannot be expected to acquire the knowledge needed to manage their risk exposures or asset accumulations over their work life. This lack coupled with de-accumulation of savings and bursting of asset pricing bubbles makes it difficult to make sensible investment decisions.

Increased lifespans and rapidly rising health care costs contribute to angst, and the combination of widespread fraud and ethical lapses of both employers and major financial institutions, provide little cause for complacency. More individuals are voluntarily or involuntarily being forced to tap into their social security pensions at an earlier age – 62 instead of 65 – despite paying a penalty for early access in the form of permanent reduction of payments received (Aproberts, 2009). In an age of increasing lifespans, this becomes even more troublesome.

Americans are now confronting the reality that their anticipated retirement might either not happen or be with severely reduced means. With the huge and growing deficits in the nation's budget (now exceeding \$ 1 trillion annually) the looming “*fiscal cliff*” would mandate severe cuts in spending across many categories and expiry of tax breaks! The resulting contraction in the economy just recovering from the *Great Recession*, could result in more job losses and further erosion in equity values, depressing the value of retirement savings yet again! The continued and increasing need to stay employed well past normal retirement age (Bryson, Iqbal and Watt, 2012), will pressure employment prospects of the younger generation, already reeling under high student loan burdens!

Today, the public sector remains the major defined benefit pension providers, as with the financial meltdown in the US and other developed markets, private pension benefits have been reduced dramatically. Well known firms that have eliminated or frozen pension plans can be found in many different industries and are not confined to poorly performing companies or even ones being “restructured”. The loss of jobs and decimation of company provided pension benefits coinciding with the drastic decline in values of retirement savings for workers has birthed envy among private sector employees for the perceived stability and security of public sector workers. With state finances in terrible shape, many states have also fallen behind in their contributions to the public sector pension funds and some have also retroactively changed the benefits formula even for the retired workers, giving rise to law-suits on the legality of these practices. The prolonged, though now slowly improving, Great Recession in the US has also seen larger numbers of job cuts in the public sector as well. Being forced to balance their budgets each year, states do not have the luxury of deficit financing like the Federal government.

With even well managed and funded retirement nest-eggs eroded over the past 3 years, and steep declines in the value of real-estate in the US, survey after survey document the angst of our ageing boomer population facing significantly reduced standard of living post retirement. Yen (2011) writes that one in two Americans now are in the poor or low-income category. Record numbers of children are participating in free school lunch programs, and even the affluent are feeling insecure about retirement. Government policies and regulatory oversight have failed miserably to stem the real effects of the declines in savings values and options. A weary public now doubts the ability and willingness of the government or system to protect their interests. In the face of sustained employment losses, slow growth in developed economies worldwide and rapidly rising costs of health care for an ageing population, we see signs of system-wide despondency. Homelessness and hunger are a growing phenomenon coexisting during a period when the standard of living and wealth creation are still rather good.

We explore the evolution of this phenomenon, the us v/s them aspects of public v/s private sector workers, rich v/s poor, state v/s federal government, and developed v/s emerging economies as we move through the inflexion point in global economies and growth. In 2007 Mohammed El-Erian wrote about “When Markets Collide” a prescient book about developments underway as

we moved to the *New Normal*. The geo-politics of reduction in the US wealth and power as the *rise of the rest* plays out involves a multi-polar world. Increased globalization means developments in one part of the world roil the whole interconnected system, and navigating one's way amid these landmines is increasingly difficult.

We also discuss the changes in health care access, costs, and insurance as a larger percentage of the population enters the age when they will consume more health care resources. Options currently available or emerging for increasing cost effectiveness of the health care system are also explored.

Risk Homeostasis – *the tendency of perceived safety improvements to engender higher risk taking* – is now working in reverse and there is widespread increase in risk aversion. Investors are reluctant to take greater risk in pursuit of better returns. This has an effect both on the availability of risk capital and its cost, as well as on the growth of retirement assets, with attendant impact on the quality of life post-retirement! An emerging view in the US is that pension plans had promised too generous benefits, and solutions to this retirement / ageing crisis would need to involve both increase in contributions by workers and reduction in the net benefits for retirees by requiring / incenting delayed retirement age (Bryson, Azhar and Watt, 2012), taxing retirement benefits higher or some combination thereof. Brown (2008) talks about the inadequacy of Pension Protection Act of 2006 for improving the Pension Benefit Guarantee Corporation program and how the PBGC shares blame for the poor financial state of the defined benefit system.

While still at very high levels, a decline in living standards gap between developed countries and others in the rest of the world seems inevitable. We see the US rein in promised benefits to retirees and senior citizens – whether it is through cutting back of benefits, means testing of beneficiaries, slowing the growth rate of inflation adjustments, taxing the benefits higher or taxing the working population more. To sum it up, we are at an inflexion point and the changes will be both huge and far-reaching in the US and around the globe.

BIBLIOGRAPHY

1. Aproberts, L. (2009), "Trends in the retirement system of the United States." *Geneva Papers on Risk & Insurance*, 34 (4), 618-630.
2. Brown, J.R. (2008), "Guaranteed Trouble: The economic effects of the pension benefit guaranty corporation", *The Journal of Economic Perspectives*, 22 (1), 177-198.
3. Bryson, Jay H., Iqbal Azhar and Watt, Sarah (2012), "Retirement in American: Extending the Finish Line", Wells Fargo Economics Group, Special Commentary 18 October.
4. El Erian (2008), "When Markets Collide: Investment Strategies for the Age of Global Economic Change," McGraw-Hill; 1 edition, New York
5. Geisel, Jerry (2007), "2 firms to freeze DB plans, add to 401(k)s." *Pensions & Investments*, Vol. 35 Issue 10, p22-22,

6. Munnell, Alicia H.; Golub-Sass, Francesca; Soto, Mauricio; Vitagliano, Francis, “Why Are Healthy Employers Freezing Their Pensions?” *Journal of Pension Benefits: Issues in Administration*, Vol. 14 Issue 4, p3-14, 12p.
7. Yen, Hope, “Census shows 1 in 2 people are poor or low-income,” Associated Press, 15 December 2011, { Verified <http://news.yahoo.com/census-shows-1-2-people-poor-low-income-054325860.html> 7 November 2012 }.

Two ways to calculate the Quick Ratio

Robert Balik*
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Introduction

Equations 1 and 2 are two ways to calculate the quick ratio.

$$1) \text{ Quick Ratio} = \frac{\text{Total Current Assets} - \text{Inventory}}{\text{Total Current Liabilities}}$$

$$2) \text{ Quick Ratio} = \frac{\text{Cash} + \text{Marketable Securities} + \text{Accounts Receivable}}{\text{Total Current Liabilities}}$$

Many corporate finance textbooks, which are used for the required introductory undergraduate finance course, use Equation 1 and illustrate this ratio using a balance sheet with four current asset accounts:

- Cash,
- Marketable securities,
- Accounts receivable,
- Inventory.

These current assets are ordered from the most liquid, cash, to the least liquid, inventory.

If these are the only current assets, the two equations are equivalent. However, most firms have other current asset accounts. Two examples are prepaid expenses and other current assets.

Objectives

The objectives are

- To show that most corporate finance textbooks use Equation 1. Additionally the balance sheet that is used to illustrate this ratio, and others, has only four current assets: cash, marketable securities, accounts receivable, and inventory.
- To show that other sources use both Equation 1 and 2.
- To illustrate the amount of difference between the two equations.

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One Finance Textbook Example

One commonly used textbook is *Essentials of Corporate Finance*, Seventh Edition, by Stephen A. Ross, Randolph W. Westerfield, and Bradford D. Jordan (McGraw-Hill Irwin, 2011). Their discussion contains the following

- Ratios are discussed in Chapter 3.
- Quick ratio is Equation 1, page 57.
- Balance sheet used to illustrate this ratio has three accounts: cash, accounts receivable, and inventory, page 53.
- End of Chapter 3, pages 73 – 77, contains examples of RMA ratios. The RMA data includes Quick Ratio values. The textbook does not mention that RMA uses Equation 2 to calculate the Quick Ratio. www.rmahq.org/.../2011_12_FRB_Definition_of_Ratios.pdf

We provide similar information for other corporate finance textbooks.

Other sources

Other sources of ratio information are library resources and the web. Examples are

- Bloomberg, uses Equation 2.
- Mergent Online, uses Equation 2.
- Morningstar, uses Equation 1.
- D&B Key Business Ratios, uses Equation 2.
- Quickratio.org, uses Equation 2.
- Compustat, Research Insight, uses Equation 2.
- S&P NetAdvantage, mentions both Equation 1 and 2 in glossary, uses Equation 2 in calculations.

Quick ratio calculations

Using money.msn.com in September 2102, the most recent annual balance sheet data for 24 non-financial firms in the Dow Jones Industrial Average, DJIA, was downloaded. For each firm, Equations 1 and 2 were used to calculate the quick ratio. The average quick ratio using Equation 1 was 22.8% greater than the quick ratio calculated using Equation 2. The percentage difference between the two quick ratio calculations ranged from 0.2% to 97.6%.

Recommendation

At a minimum, textbooks should

- Mention that there are two equations for the Quick Ratio (currently, no textbook does this),
- Include balance sheet examples that contain prepaid expenses and other current assets,
- Mention that external data sources that provide a quick ratio should be checked for the equation being used.

The U.S. Federal and State Corporate Tax Simplifications with the LG Tax System

John Lee^{*} and Robert Kao^{**}

Abstract

The U.S. corporate and personal taxations have long been an imminent subject discussed by many legislators and policymakers. Many recommendations and proposals on the possible impacts on the economy, revenue, equity, and efficiency are emphasized. More and more citizens, corporations, and government offices would like to have fair and simplified tax systems. In this paper, a new simple linear and gradual (LG) tax system has been developed and analyzed to compare with the current progressive tax systems. This paper discusses federal and state corporation tax simplifications with the LG Tax System.

The benefits of this proposed tax simplification process could combine all filing statuses, taxable incomes, tax rate formulas, tax rate range checks, tax rate, and tax calculations into short tax simplification phases. Tax rate formulas could then connect to the related filing statuses, taxable income, and income brackets. The LG tax system with 2-3 brackets may replace multi-brackets or flat tax rate in corporation tax systems. The range check is introduced as a tool for testing the accuracy of the calculations. Both procedures would simplify tax rate classifications and calculations. Subsequently, the total tax amounts will be calculated automatically or manually with simple procedures.

The proposed LG tax rates can be modified easily and reasonably during a special situation, such as a recession or a booming economy. These tax rates represent the minor tax rate differences with the current system only within 0.5% of margin. For the ease of tax rate modification, tax office could change the rates and estimated the revised revenue rapidly. The streamline of tax analysis and revenue projection would enhance the efficiency of the revenue offices. In conclusion, we could anticipate an increase of total tax revenue from the reduction of tax preparation time, the complexity of tax rates analysis, and the complications of tax rate modification.

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Using Debt Financing to Increase One's Wealth

Charles Johnston*

SHORT ABSTRACT:

- Purpose: an interesting and worthwhile research topic
- Research method: secondary research, based on both theory and practice, including the author's own experiences of efficiently using debt financing.
- Findings and their importance for the readers

KEYWORDS: personal financial planning, debt financing, investment planning, principles of finance, debt management, risk management, the American dream

INTRODUCTION: Motivation for this research paper: Recent financial crisis was partly caused and worsened by many U.S. businesses and households being over-indebted. The recovery process has involved the liquidation of some debts through government bailouts of some too-big-to-fail companies, defaults on debt by unemployed workers, refinancing debt, and paying down debts by ongoing businesses and households. Credit standards have been significantly raised by banks offering new loans. Demand for new loans has significantly declined. Household debt/income and debt/asset ratios are declining. Investors have become more risk averse and more debt averse. The market has over-corrected. Consequently, new profitable opportunities now exist for increased use of debt financing for investments that are expected to be profitable at a manageable level of risk.

LITERATURE REVIEW

- * life-cycle hypothesis of consumption and saving:
- * debt financing vs. equity financing: household savings is equity financing. Save to accumulate an emergency fund. Save by paying down debt. Given a positive household cash flow, pay off the highest-interest debt first. Use debt financing to leverage equity financing.
- * conventional/traditional advice from financial planners: Live within your means; spend less than you earn. Don't borrow money to pay for non-investment spending. Don't borrow money at a high interest rate. Pay off your debt as soon as possible. Pay off your debt before investing for retirement. Don't buy stocks on margin. Don't borrow money personally for a business investment.
- * contribution(s) to the literature: This research paper recommends a more efficient use of debt financing to help individuals and families increase their wealth.

PROFITABLE PERSONAL INVESTMENTS USING DEBT FINANCING

- College education: Use any available college scholarships, grants, college fund, and part-time work to help finance your education. When additional financing is needed, use debt financing to pay for college; that's better than skipping college or dropping out of college. Choose a college degree or degrees that will qualify you for a professional career path with a relatively high income, such as a BBA and MBA in finance. Choose a relatively low-cost, accredited college or university with a good reputation/rating in your degree specialty. Be a good student.

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- Buying a home: most mortgages are low-cost, after taxes. Buy an undervalued house in a good neighborhood that is likely to appreciate. Have it inspected and ask the seller to make any needed

costly repairs. Negotiate for a better price and better financing terms. Buy a house that's big enough to meet your family's lifetime needs – so you don't have to keep trading up. Don't buy much more house than you need for location, safety, and a comfortable, modest lifestyle.

- Buying a car: better than leasing, but buy one that best meets your transportation needs, and is a few years old with low mileage and in good repair.
- Starting a business: a personal loan may be the only available financing to start your own firm.
- Investing in common stocks, using a margin account: buying on margin enables you to use financial leverage to buy more for a given amount of equity investment. Most U.S. companies are mostly debt-financed. Debt financing after-taxes is usually lower-cost financing than equity financing. Using more debt-financing increases one's return on equity, for a profitable company.

DEBT MANAGEMENT TO REDUCE COSTS, INCREASE RETURNS, AND MANAGE RISKS

- Reduce Costs: borrow low and buy low, globally. Use the lowest-cost available credit.
- Increase Returns: use investment criteria to maximize expected returns: present discounted value, internal rate of return, capital budgeting, working capital management. Be rational, self-interested, and forward-looking. Be a value investor. Negotiate for a better price.
- Manage Risks: Some debt is riskier than other debt. Important risks include interest rate risk, default risk, inflation risk, political risk of tax increases and unfavorable changes in government regulations, other market risks and unique risks. Diversify, invest long-term, and use a credit line to supplement an emergency fund for liquidity management. Stay within debt ratio guidelines and pay all bills on-time to maintain a high credit score.

CONCLUSIONS WITH LIMITS OF RESEARCH FINDINGS, AND RECOMMENDED FUTURE RESEARCH

- Conclusions: This research paper recommends a more efficient use of debt financing to help individuals and families increase their wealth. Efficiently following this financial advice would help people achieve "the American dream".
- Limits of Research Findings: This research paper's recommended use of debt financing is best for most people, in principle, as a general rule, but may not best for every person. No general personal financial advice is best for every unique individual at every point in their life.
- Recommended Future Research

REFERENCES

- Journal articles: most references, including the author's research paper on profitably investing in common stocks
- Government data sources, including the Federal Reserve
- Textbooks: for finance principles, including *Personal Financial Planning* by Gitman & Joehnk
- Personal finance books written by professional financial advisers, including books by Charles Schwab, Peter Lynch, Suze Orman, Donald Trump, Brett Machtig, Ginger Applegarth, and Eric Edelman
- Periodicals: for current events and current data