

International Multidisciplinary Journal

Has been issued since 2010. ISSN 2219-8229, E-ISSN 2224-0136. 2014. Vol.(81). Nº 8-2. Issued 12 times a year Impact factor of Russian Science Citation Index 2012 – 0,259 Impact factor Index Copernicus 2011 - 5,09

EDITORIAL STAFF

- Dr. Cherkasov Aleksandr Sochi State University, Sochi, Russia (Editor-in-Chief)
- Dr. Goncharova Nadezhda Research Institute of medical primatology RAMS, Sochi, Russia
- Dr. Khodasevich Leonid Sochi State University, Sochi, Russia
- Dr. Kuvshinov Gennadiy Sochi State University, Sochi, Russia
- Dr. Rybak Oleg Scientific Research Centre of the RAS, Sochi, Russia

EDITORIAL BOARD

- Dr. Abdrakhmatov Kanat Institute of seismology NAS, Bishkek, Kyrgyzstan
- Dr. Bazhanov Evgeny Diplomatic Academy Ministry of Foreign Affairs of the Russian Federation, Moscow, Russia
 - Dr. Beckman Johan University of Helsinki, Helsinki, Finland
 - Dr. Blinnikov Sergei Institute of theoretical and experimental physics, Moscow, Russia
 - Dr. Deene Shivakumar Central University of Karnataka, Karnataka, India
 - Dr. Dogonadze Shota Georgian Technical University, Tbilisi, Georgia
 - Dr. Elyukhin Vyacheslav Center of Investigations and Advanced Education, Mexico, Mexico
- Dr. Halczak Bohdan University of Zielona Góra, Poland Dr. Kolesnik Irina Institute of Ukrainian History, National Academy of Sciences of Ukraine, Kiev, Ukraine
- Dr. Kopylov Vladimir Physical-Technical Institute National Academy of Science of Belarus, Minsk, Belarus
 - Dr. Krinko Evgeny Southern Scientific Centre of RAS, Rostov-on-Don, Russia
 - Dr. Malinauskas Romualdas Lithuanian Academy of Physical Education, Kaunas, Lithuania
 - Dr. Markwick Roger School of Humanities and Social Science, The University of Newcastle, Australia
 - Dr. Mathivanan D. St. Eugene University, Lusaka, Zambia
 - Dr. Mydin Md Azree Othuman Universiti Sains Malaysia, Penang, Malaysia
 - Dr. Menjkovsky Vaycheslav University of Belarusian State, Minsk, Belarus
 - Dr. Müller Martin University St. Gallen, St. Gallen, Switzerland
 - Dr. Ojovan Michael Imperial college London, London, United Kingdom
 - Dr. Ransberger Maria University of Bayreuth, Bayreuth, Germany Dr. Šmigel' Michal Matej Bel University, Banská Bystrica, Slovakia

 - Dr. Ziatdinov Rushan Fatih University, Istanbul, Turkey

The journal is registered by Federal Service for Supervision of Mass Media, Communications and Protection of Cultural Heritage (Russia). Registration Certificate III № ФС77-50466 4 July 2012.

Journal is indexed by: Academic Index (USA), CCG-IBT BIBLIOTECA (Mexico), DOAJ (Sweden), Galter Search Beta (USA), EBSCOhost Electronic Jornals Service (USA), Electronic Journals Index (USA), Electronic scientific library (Russia), ExLibris The bridge to knowledge (USA), Google scholar (USA), Index Copernicus (Poland), math-jobs.com (Switzerland), One Search (United Kingdom), Open J-Gate (India), Poudre River Public Library District (USA), ResearchBib (Japan), Research Gate (USA), The Medical Library of the Chinese People's Liberation Army (China).

All manuscripts are peer reviewed by experts in the respective field. Authors of the manuscripts bear responsibility for their content, credibility and reliability.

Editorial board doesn't expect the manuscripts' authors to always agree with its opinion.

Postal Address: 26/2 Konstitutcii, Office 6 354000 Sochi, Russia

Website: http://erjournal.ru/en/index.html

E-mail: evr2010@rambler.ru

Founder and Editor: Academic Publishing

House Researcher

Passed for printing 25.8.14. Format 21 × 29,7/4. Enamel-paper. Print screen. Headset Georgia. Ych. Izd. l. 5,1. Ysl. pech. l. 5,8. Circulation 1000 copies. Order Nº 149. **JROPEAN RESEARCHE**

2014

Nº 8-2

РОПЕЙСКИЙ ИССЛЕДОВАТЕЛ



МЕЖДУНАРОДНЫЙ МУЛЬТИДИСЦИПЛИНАРНЫЙ ЖУРНАЛ

Издается с 2010 г. ISSN 2219-8229, E-ISSN 2224-0136. 2014. № 8-2 (81). Выходит 12 раз в год. Импакт-фактор РИНЦ 2012 - 0,259 Импакт-фактор Index Copernicus 2011 – 5,09

РЕДАКЦИОННАЯ КОЛЛЕГИЯ

Черкасов Александр – Сочинский государственный университет, Сочи, Россия (Гл. редактор)

Гончарова Належла Научно-исследовательский институт мелипинской приматологии РАМН, Сочи, Россия

Кувшинов Геннадий – Сочинский государственный университет, Сочи, Россия

Рыбак Олег - Сочинский научно-исследовательский центр Российской академии наук, Сочи, Россия

Ходасевич Леонид - Сочинский государственный университет, Сочи, Россия

РЕДАКЦИОННЫЙ СОВЕТ

Абдрахматов Канатбек – Институт сейсмологии НАН, Бишкек, Киргизия

Бажанов Евгений – Дипломатическая академия Министерства иностранных дел России, Москва, Россия

Бекман Йохан – Университет г. Хельсинки, Хельсинки, Финляндия

Блинников Сергей – Институт теоретической и экспериментальной физики, Москва, Россия

Гальчак Богдан – Университет г. Зелона Гура, Зелона Гура, Польша

Дине Шивакумар — Центральный университет г. Карнатака, Карнатака, Индия **Догонадзе Шота** — Грузинский технический университет, Тбилиси, Грузия

Елюхин Вячеслав – Центр исследований и передового обучения, Мехико, Мексика

Зиатдинов Рушан – Университет Фатих, Стамбул, Турция

Колесник Ирина – Институт истории Украины НАН Украины, Киев, Украина

Копылов Владимир – Физико-технический институт Национальной академии наук Беларуси, Минск, Беларусь

Кринко Евгений – Южный научный центр РАН, Ростов-на-Дону, Россия

Малинаускас Ромуальдас – Литовская академия физической культуры, Каунас, Литва Марвик Роджер – Школа гуманитарных и общественных наук, Университет Ньюкасла,

Мативанан Д. – Университет Санкт Евген, Лусака, Замбия

Мудин Мд Азри Отхуман – Университет Малайзии, Пенанг, Малайзия

Меньковский Вячеслав - Белорусский государственный университет, Минск, Республика Беларусь

Мюллер Мартин – Университет Санкт Галлен, г. Санкт Галлен, Швейцария

Ожован Михаил – Имперский колледж Лондона, г. Лондон, Соединенное Королевство

Рансбергер Мария – Байротский университет, Байрот, Германия

Шмигель Михал – Университет Матея Бэла, Банска Быстрица, Словакия

Журнал зарегистрирован Федеральной службой по надзору в сфере массовых коммуникаций, связи и охраны культурного наследия (Российская Федерация). Свидетельство о регистрации средства массовой информации ПИ № ФС77-50466 от 4 июля 2012 г.

Журнал индексируется в: Academic Index (США), CCG-IBT BIBLIOTECA (Мексика), DOAJ (IIIBERRAR), GalterSearch Beta (CIIIA), EBSCOhost Electronic Jornals Service (CIIIA), Electronic Journals Index (CIIIA), ENLibris The bridge to knowledge (CIIIA), Google scholar (США), Index Copernicus (Польша), math-jobs.com (Швейцария), Научная электронная библиотека (Россия), Open J-Gate (Индия), ResearchBib (Япония), ResearchGate (США), The Medical Library of the Chinese People's Liberation Army (Китай) и др.

Статьи, поступившие в редакцию, рецензируются. За достоверность сведений, изложенных в статьях, ответственность несут авторы публикаций.

Мнение редакции может не совпадать с мнением авторов материалов.

Адрес редакции: 354000, Россия, г. Сочи, ул. Конституции, д. 26/2, оф. 6 Сайт журнала: http://erjournal.ru/

E-mail: evr2010@rambler.ru

Учредитель и издатель: ООО «Научный издательский дом "Исследователь"» - Academic Publishing House Researcher

Подписано в печать 25.8.14.

Формат $21 \times 29,7/4$.

Бумага офсетная.

Печать трафаретная.

Гарнитура Georgia.

Уч.-изд. л. 5,1. Усл. печ. л. 5,8.

Тираж 1000 экз. Заказ № 149.

©European Researcher, 2014

CONTENTS

Physical and Mathematical sciences

Merab Aghniashvili, Diana Mtchedlishvili The Fourth Main Boundam Value Broblem of Dynamics of Thomas, resilioner's	
The Fourth Main Boundary Value Problem of Dynamics of Thermo-resiliency's Momentum Theory	1488
Biological sciences	
Swati Tyagi, Neelam Garg, Rajan Paudel Environmental Degradation: Causes and Consequences	1491
Economic sciences	
Sribas Goswami Clean Coal Initiatives in India	1499
Ena Kumbara, Ali Göksu The Impact of Brand Equity Assets on Consumer Preference for Foreign Brands in Bosnia and Herzegovina	1514
Irma Jasarspahic, Teoman Duman Consumer Attitude Toward Mobile Marketing in Bosnia and Herzegovina	1523
Danil M. Matveev Current State of Production and Finance Development of Scientific and Technological Progress in Agriculture	1532
Sanam S. Mirzaliyeva, Ilyas N. Rakhimzhanov Problems and New Attitudes of Business Evaluation for M&A in Kazakhstan	1546
Şerife Özlen The Effects of Domestic Macroeconomic Determinants on Stock Returns: A Sector Level Analysis	1551

Copyright © 2014 by Academic Publishing House Researcher



Published in the Russian Federation European Researcher Has been issued since 2010. ISSN 2219-8229 E-ISSN 2224-0136 Vol. 81, No. 8-2, pp. 1488-1490, 2014

DOI: 10.13187/er.2014.81.1488 www.erjournal.ru



Physical and Mathematical sciences

Физико-Математические науки

The Fourth Main Boundary Value Problem of Dynamics of Thermo-resiliency's **Momentum Theory**

- ¹ Merab Aghniashvili
- ² Diana Mtchedlishvili

1-2 Iakob Gogebashvili Telavi State University, Georgia 2200 Telavi, 1, Kartuli Universiteti Str. Doctor of Physical and Mathematical sciences E-mail: diana.mtchedlishvili@gmail.com

- ¹ Associate Professor
- ² Professor

In the paper is presented the fourth main boundary value problem of Dynamics of Thermoresiliency's Momentum theory. The problem states to find in the cylinder D_l the regular solution of the system:

$$M(\partial_x)\mathcal{U} - \nu\chi\theta - \chi^0\frac{\partial^2\mathcal{U}}{\partial t^2} = \mathcal{H}, \ \Delta\theta - \frac{1}{\vartheta}\frac{\partial\theta}{\partial t} - \eta\frac{\partial}{\partial t} \ div \ u = \mathcal{H}_7,$$

which satisfies the initial conditions:

 $\forall x \in D : \lim_{t \to 0} U(x,t) = \varphi^{(0)}(x), \lim_{t \to 0} \theta(x,t) = \varphi_7^{(0)}(x), \ \lim_{t \to 0} \frac{\partial U(x,t)}{\partial t} = \varphi^{(1)}(x)$ and the boundary conditions:

$$\forall (x,t) \in S_l : \lim_{D \ni x \to y \in S} PU = f, \quad \lim_{D \ni x \to y \in S} \{\theta\}_S^{\pm} = f_7.$$
 The uniqueness theorem of the solution is proved for this problem.

Keywords: the main boundary value problem; initial conditions; boundary conditions; the uniqueness theorem of the solution.

Introduction

Let D be a finite or infinite three-dimensional space with the compact boundary S from the class $\Lambda_2(\alpha)$, $(\alpha > 0)$.

Denote by D_l and S_l cylinders $D_l = D \times l$, $S_l = S \times l$, respectively, where $l = [0, \infty)$.

In the problems of Dynamics of Thermo-resiliency's Momentum theory any point of environment is characterized by seven quantities: a movement vector $-u = (u_1, u_2, u_3)$, a rotation vector - $\omega = (\omega_1, \omega_2, \omega_3)$ and a temperature deviation - θ .

The main equations of the Thermo-resiliency's Momentum theory can be written in a matrix form as follows [1], [2]:

$$M(\partial_x)\mathcal{U} - \nu\chi\theta - \chi^0\frac{\partial^2\mathcal{U}}{\partial t^2} = \mathcal{H}, \ \Delta\theta - \frac{1}{\theta}\frac{\partial\theta}{\partial t} - \eta\frac{\partial}{\partial t}\ div\ u = \mathcal{H}_7,$$
 (1)

 $M(\partial_{\chi})\mathcal{U} - \nu\chi\theta - \chi^0 \frac{\partial^2 \mathcal{U}}{\partial t^2} = \mathcal{H}, \quad \Delta\theta - \frac{1}{\vartheta} \frac{\partial\theta}{\partial t} - \eta \frac{\partial}{\partial t} \ div \ u = \mathcal{H}_7,$ where $M(\partial_{\chi})$ is a matrix differential operator of the Momentum Resilience theory [3] and $\chi = (\partial_{\chi_1}, \partial_{\chi_2}, \partial_{\chi_3}, 0, 0, 0), \chi^0 = \|\chi^0_{ij}\|_{6\times 6}, \chi^0_{ii} = \rho \text{ for } i = 1, 2, 3, \chi^0_{ii} = \zeta \text{ for } i = 4, 5, 6, \chi^0_{ij} = 0 \text{ for } i \neq j,$ $\mathcal{H} = (-\rho F, -\rho \mathcal{Y}), \mathcal{H}_7 = -\frac{1}{9} \mathcal{Q}, \mathcal{U} = (u, \omega).$

Let $\varphi^{(i)} = ({}_{\varphi}^{1}(i), {}_{\varphi}^{2}(i))$ for i = 0, 1, where ${}_{\varphi}^{k}(i) = (\varphi_{1}^{k_{(i)}}, \varphi_{2}^{k_{(i)}}, \varphi_{3}^{k_{(i)}})$ for k = 1, 2 and $\varphi_{7}^{(i)}$ for i = 0, 1 be functions given in the area \overline{D} , while $f = (f^{(1)}, f^{(2)})$, $f^{(i)} = (f_{1}^{(i)}, f_{2}^{(i)}, f_{3}^{(i)})$ for i = 1, 2 and f_{7} are functions given on S_l .

Definition

Vector-function $U = (u, \omega, \theta)$ is called as regular in the area D_l^+ if $U \in C^1(\overline{D}_l^+) \cap C^2(D_l^+)$ for $\forall t \in l \text{ and } B(\partial x, \partial t) \text{U is integrable in the area } D^+.$

Analogously, vector-function $U = (u, \omega, \theta)$ is called as regular in the area D_l^- if $U \in C^1(\overline{D}_l^-) \cap$

$$|U(x,\tau)| \le \frac{c(t)}{1+|x|^2}, \left|\frac{\partial U(x,\tau)}{\partial t}\right| \le \frac{c(t)}{1+|x|^2}, \left|\frac{\partial U(x,\tau)}{\partial x_i}\right| \le \frac{c(t)}{1+|x|^2},\tag{2}$$

 $C^2(D_l^-)$ for $\forall t \in l$ and $B(\partial x, \partial t)$ U is integrable in the area $D^- \cap \mathcal{M}(o, \delta)$ for any number $\delta > 0$ and $|U(x, \tau)| \leq \frac{c(t)}{1+|x|^2}, \left|\frac{\partial U(x, \tau)}{\partial t}\right| \leq \frac{c(t)}{1+|x|^2}, \left|\frac{\partial U(x, \tau)}{\partial x_i}\right| \leq \frac{c(t)}{1+|x|^2},$ (2) where $B(\partial x, \partial t)$ is an operator standing on the left side of the system (1) and is written in the form of a matrix differential operator.

In the paper is studied the following problem of Dynamics of Thermo-resiliency's Momentum theory: to find in the cylinder D_l the regular solution of the system (1) which satisfies the initial conditions:

 $\forall x \in D: \lim_{t \to 0} U(x, t) = \varphi^{(0)}(x), \lim_{t \to 0} \theta(x, t) = \varphi_7^{(0)}(x), \lim_{t \to 0} \frac{\partial U(x, t)}{\partial t} = \varphi^{(1)}(x)$ and the boundary conditions:

$$\forall (x,t) \in S_l : \lim_{D \ni x \to y \in S} PU = f, \quad \lim_{D \ni x \to y \in S} \{\theta\}_S^{\pm} = f_7.$$
 Here, $P = P(\partial x, n)$ is an operator of thermo-momentary voltage:

$$P(\partial x, n)U = T(\partial x, n)U - ve\theta$$

where $T(\partial x, n)$ is an operator of momentary voltage [3], $e = (n_1, n_2, n_3, 0, 0, 0)$, $\mathcal{U} = (u, \omega)$ and $n(n_1, n_2, n_3)$ is a normal of the surface S.

The main result

The following uniqueness theorem is true:

Theorem. In the cylinder D_l^{\pm} the regular solution of the homogenous problem, corresponding to the above stated problem, is identical to 0.

The proof of the theorem. Let $U = (\mathcal{U}, \theta)$ be a regular solution in D_l^+ of the homogenous equation corresponding to (1). Then, the following formula is true:

$$\frac{\partial}{\partial t} \int_{D^{+}} \left\{ \frac{1}{2} \sum_{i=1}^{6} \chi_{ii}^{0} \left| \frac{\partial \mathcal{U}_{i}}{\partial t} \right|^{2} + \frac{1}{2} E(\mathcal{U}, \mathcal{U}) + \frac{\nu}{2 \vartheta \eta} |\theta|^{2} \right\} dx + \\
+ \frac{\nu}{\eta} \int_{D^{+}} |grad \theta|^{2} dx = \int_{S} \left\{ \frac{\partial \mathcal{U}}{\partial t} P \mathcal{U} - \frac{\nu}{\eta} \theta \frac{\partial \theta}{\partial n} \right\} dS, \tag{3}$$

where E(U, U) is a positively defined form [3].

For the regular solution of the homogenous problem in D_l^+ the right side of (3) is equal to 0. Hence, the left side of it is also equal to 0, from which follows that U = 0, $\theta = 0$. So, U = 0.

Now, let $U = (\mathcal{U}, \theta)$ be a regular solution of the homogenous problem in D_l^- , corresponding to the system (1). We can write (3) for $D^- \cap \mathcal{M}(0, z)$ as follows:

$$\frac{\partial}{\partial t} \int_{D^{-}\cap\mathcal{M}(0,z)} \left\{ \frac{1}{2} \sum_{i=1}^{6} \chi_{ii}^{0} \left| \frac{\partial \mathcal{U}_{i}}{\partial t} \right|^{2} + \frac{1}{2} E(\mathcal{U}, \mathcal{U}) + \frac{\nu}{2\vartheta \eta} |\theta|^{2} \right\} dx + \\ + \frac{\nu}{\eta} \int_{D^{-}\cap\mathcal{M}(0,z)} |grad \theta|^{2} dx = \int_{C(0,z)} \left\{ \frac{\partial \mathcal{U}}{\partial t} P \mathcal{U} + \frac{\nu}{\eta} \theta \frac{\partial \theta}{\partial n} \right\} dS,$$

where z is a sufficiently large number.

Considering the conditions (2) and taking the limit of the above equation as $z \to \infty$, we get that

$$\frac{\partial}{\partial t} \int_{D_{-}} \left\{ \frac{1}{2} \sum_{i=1}^{6} \chi_{ii}^{0} \left| \frac{\partial \mathcal{U}_{i}}{\partial t} \right|^{2} + \frac{1}{2} E(\mathcal{U}, \mathcal{U}) + \frac{\nu}{2 \vartheta \eta} |\theta|^{2} \right\} dx + \frac{\nu}{\eta} \int_{D_{-}} |grad \theta|^{2} dx = 0,$$

from which, using the homogeneity of the initial conditions, we have:

$$U=0$$

Thus, the theorem is proved.

Conclusion

The main task was to prove the uniqueness theorem of the solution of the fourth main boundary value problem of Dynamics of Thermo-resiliency's Momentum theory. In the cylinder D_l was found the regular solution of the system:

$$M(\partial_x)\mathcal{U} - \nu\chi\theta - \chi^0\frac{\partial^2\mathcal{U}}{\partial t^2} = \mathcal{H}, \ \Delta\theta - \frac{1}{\vartheta}\frac{\partial\theta}{\partial t} - \eta\frac{\partial}{\partial t}\ div\ u = \mathcal{H}_7,$$
 which satisfies the following initial and boundary conditions:

$$\forall x \in D: \lim_{t \to 0} U(x, t) = \varphi^{(0)}(x), \lim_{t \to 0} \theta(x, t) = \varphi_7^{(0)}(x), \lim_{t \to 0} \frac{\partial U(x, t)}{\partial t} = \varphi^{(1)}(x);$$
$$\forall (x, t) \in S_l: \lim_{D \ni x \to y \in S} PU = f, \lim_{D \ni x \to y \in S} \{\theta\}_S^{\pm} = f_7.$$

References:

- Novatski, V. (1975). Resilience theory. *Moscow* (in Russian)
- 2. Aghniashvili, M. (1976). Some boundary value problems of thermo-momentum resilience theory. *Tbilisi* (in Russian)
- 3. Kupradze, V., Gegelia, T., Basheleishvili, M., Burtchuladze, T. (1976). Three-dimensional problems of mathematical resilience theory and thermo-resiliency. Tbilisi (in Russian)

Copyright © 2014 by Academic Publishing House Researcher



Published in the Russian Federation European Researcher Has been issued since 2010. ISSN 2219-8229 E-ISSN 2224-0136 Vol. 81, No. 8-2, pp. 1491-1498, 2014

DOI: 10.13187/er.2014.81.1491

www.erjournal.ru



Biological sciences

Биологические науки

Environmental Degradation: Causes and Consequences

- ¹Swati Tyagi*
- ¹Neelam Garg
- ² Rajan Paudel
- ¹ Department of Microbiology, Kurukshetra University, Kurukshetra (Haryana), India
- ² Department of Plant Pathology, SVPUA&T, Meerut-250110, India
- *E-mail: swatirajtyagi7@gmail.com

Abstract

The subject of environmental economics is at the forefront of the green debate: the environment can no longer be viewed as an entity separate from the economy. Environmental degradation is of many types and have many consequences. To address this challenge a number of studies have been conducted in both developing and developed countries applying different methods to capture health benefits from improved environmental quality. Minimizing exposure to environmental risk factors by enhancing air quality and access to improved sources of drinking and bathing water, sanitation and clean energy is found to be associated with significant health benefits and can contribute significantly to the achievement of the Millennium Development Goals of environmental sustainability, health and development. In this paper, I describe the national and global causes and consequences of environmental degradation and social injustice. This paper provides a review of the literature on studies associated with reduced environmental risk and in particular focusing on reduced air pollution, enhanced water quality and climate change mitigation.

Keywords: Environment degradation; consequences; pollution and climate.

Introduction

The environment affects our health in a variety of ways. The interaction between human health and the environment has been extensively studied and environmental risks have been proven to significantly impact human health, either directly by exposing people to harmful agents, or indirectly, by disrupting life-sustaining ecosystems (**Remoundou and Koundouri, 2009**). Environmental degradation is the deterioration of the environment through depletion of natural resources such as air, water and soil; the destruction of ecosystems and the extinction of wildlife. Environmental degradation may be defined as any change or disturbance to the environment perceived to be deleterious or undesirable. Environmental degradation is one of the Ten Threats officially cautioned by the **High Level Threat Panel** of the **United Nations. The United Nations International Strategy for Disaster Reduction** defines environmental degradation as "The reduction of the capacity of the environment to meet social and ecological

objectives, and needs". The primary cause of environmental degradation is human disturbance. The degree of the environmental impact varies with the cause, the habitat, and the plants and animals that inhabit it. Humans and their activities are a major source of environmental degradation. (Wikipedia.com)

Worldwide the greatest effects on the health of individuals and populations result from environmental degradation and social injustice. The two operate inconsort. (Martin Donohoe, 2003). Causes include overpopulation, air and water pollution, deforestation, global warming, unsustainable agricultural and fishing practices, overconsumption ("affluenza"), maldistribution of wealth, the rise of the corporation, the Third World debt crisis, and militarization and wars. Mining is also a destructive development activity where ecology suffers at the altar of economy. Scientific mining operations accompanied by ecological restoration and regeneration of mined wastelands and judicious use of geological resources, with search for eco-friendly substitutes and alternatives must provide sensational revelation to the impact of mining on human ecosystem (Singh and Chauhan, 2010).

Consequences include increased poverty, overcrowding, famine, weather extremes, species loss, acute and chronic medical illnesses, war and human rights abuses, and an increasingly unstable global situation that portends Malthusian chaos and disaster. Unfortunately, most of the world's governments, guided by self-interest (or self-preservation) have adapted too slowly to environmental changes and as such face decreasing internal stability, their health care systems in crisis. The report also estimates that 24% of the global disease burden (healthy life years lost) and 23% of all deaths (premature mortality) are attributable to environmental factors, with the environmental burden of diseases being 15 times higher in developing countries than in developed countries, due to differences in exposure to environmental risks and access to health care.

The major cause of the environmental pollution are modern urbanization, industrialization, over-population growth, deforestation etc. Environmental pollution refers to the degradation of quality and quantity of natural resources. Different kinds of the human activities are the main reasons of environmental degradation. These has led to environment changes that have become harmful to all living beings. The smoke emitted by the vehicles and factories increases the amount of poisonous gases in the air. Mostly, we can see pollution in urban areas where population is increasing rapidly. The waste products, smoke emitted by vehicles and industries are the main causes of pollution. Unplanned urbanization and industrialization have caused water, air and sound pollution. Urbanization and industrialization help to increase pollution of the sources of water. Similarly, the smoke emitted by vehicles and industries like Chlorofluorocarbon, nitrogen oxide, carbon monoxide and other dust particles pollute air, and another cause of environmental degradation is sound pollution. The main cause of sound pollution are vehicles, loud speaker, mill etc. the excessive use of natural resources diminishes these resources and creates imbalance of the environment. This results in the over consumption of natural resources. Deforestation, over use of pesticides. fertilizer insecticides. chemical and congested housing or unmanaged urbanization, industrialization and production of litters, sewages and garages etc. are the major reasons to deteriorate quality of the environment. Pressure of population is awful in town which results air, water and sound population too. Deforestation provokes the wildlife and other organism to the verge of extinction. The forest areas has been cleared for agricultural land, settlement and to collect the useful herbs. This results in environmental degradation. Global warming is another result of environmental degradation. The temperature of the earth is rising warmer and warmer and due to rise in temperature, the polar icecaps melting and the ice an the colder regions is not thick as it was before. Many species are lost day by day due to various activities of the human beings. The life of the creature will be in danger if environment goes on deteriorating in the same way. The report also estimates that 24% of the global disease burden (healthy life years lost) and 23% of all deaths (premature mortality) are attributable to environmental factors, with the environmental burden of diseases being 15 times higher in developing countries than in developed countries, due to differences in exposure to environmental risks and access to health care. So, to live happy and prosperous life we must conserve our environment and should emphasize on Environmental Degradation and its effects.

Air pollution

Air pollution is unfortunately the common causes of environmental degradation. Pollution introduces contaminants into the environment that can maim or even kill plant and animal species. Industry and automobiles are the primary and secondary contributors to air pollution worldwide (Kay, 1999). Air pollution is a major environmental risk to health and is estimated to scause approximately two million premature deaths worldwide per year [24]. A reduction of air pollution is expected to reduce the global burden of disease from respiratory infections, heart disease, and lung cancer. As air quality is a major concern for both developed and developing countries, a large number of empirical studies attempting to monetize the benefits to health generated by improved air quality have appeared in the literature worldwide (Kyriaki Remoundou and Phoebe Koundouri 2009). For every gallon of gasoline manufactured, distributed, and then burned in a vehicle, 25 pounds of carbon dioxide are produced, along with carbon monoxides, sulfur dioxide, nitrogen dioxide, and particulate matter; these emissions contribute to increased global warming (Martin Donohoe, 2003; Mark, 1997). In the United States, there is one car for every two people, in Mexico one for every eight, and in China one for every 100. The global auto population is expected to double in the next 25-50 years (Mark, 1997). The average number of miles traveled/car/ year in the United States has more than doubled, from 4570 in 1965 to 11,400 in 1999 (Amicus Journal Staff, 1999a). The average fuel efficiency of US automobiles has decreased over the last few years, due in part to stagnant fuel economy standards, relatively low oil prices, and a growing market for low efficiency pick-ups, mini-vans and sports utility vehicles (SUVs, which now outsell cars) (Martin Donohoe, 2003). Current standards are 27.5 miles per gallon (MPG) for passenger cars and 20.7 MPG for light trucks and SUVs (Sierra Magazine Staff, 1997b; PSR Environment & Health Update, 1999a). The nation's 3.3 million diesel trucks and buses, rolling smokestacks, account for almost 3/4 of the estimated cancer risk from auto-related air pollution (Mark & Morey, 2000). In 1997, the Environmental Protection Agency (EPA) proposed new rules that will require diesel manufacturers to build cleaner engines and the oil industry to produce much cleaner fuel. Under these rules, the minimal mile-per-gallon requirements for SUVs could soon match those of automobiles (Kluger, 1999), although the current administration has opposed these changes. The main conclusion from the literature review is that some forms of air pollution, notably inhalable particulate matter and ambient lead, are serious matters for concern in the developing world since they are associated with severe health damages in monetary terms. (Martin Donohoe, 2003).

Water pollution

Microbe contamination of groundwater due to sewage outfalls and high concentration of nutrients in marine and coastal waters due to agricultural runoff are among the most serious threats. Contact with unsafe drinking or bathing water can impose serious risks (both acute and delayed) to human health. While tap water is subject to treatment and is required to meet detailed testingand purity standards, it is not always disinfected of diarrhea inducing microorganisms, as illustrated by waterborne disease outbreaks such as that caused by Cryptosporidium in Milwaukie in 1993, which affected over 400,000people. Furthermore, fecal coliforms are not prohibited in bottled water (Nation Staff, 1996), and water bottled and sold within the same state is not subject to Food and Drug Administration standards (Gross, 1999).

Today 40% of waters are unfit for fishing or swimming, and levels of mercury in fish in 40 states. Clean Water Act of 1972 states to publish a list of all bodies of water that fail to meet water quality standards, and for the states to set pollution limits and scale back pollution in watersheds until standards are met, compliance is negligible and enforcement weak. Discharge of untreated sewage is the single most important cause for pollution of surface and ground water in the India. There is a large gap between generation and treatment of domestic waste water in the India. The problem is not only that India lacks sufficient treatment capacity but also that the sewage treatment plants that exist do not operate and are not maintained.

In a National Resources Defense Council study of the quality of bottled water (Nation Staff, 1996), approximately one-fifth of samples exceeded bacterial purity guidelines and/or safe levels of arsenic or other synthetic organic chemicals (Amicus Journal Staff, 2000a). Between 25% and 40% of bottled water was merely repackaged municipal tap water (Nation Staff, 1996). Dwight *et al.* apply the cost of illness approach and Shuval calculate the disability-adjusted life years (DALY), to quantify the health burden from illnesses associated with exposure to polluted recreational coastal

waters. India is recognised as has having major issues with water pollution, predominately due to untreated sewerage. Rivers such as the Ganges, the Yamuna and Mithi Rivers, all flowing through highly populated areas, thus polluted. Effluents are another by-product of industries which poses threat to the environment, leather and tanning industries, petroleum industries and chemical manufacturing industries create major waste products which are released directly into nearby streams without treatment, creating river pollution and causing harm to aquatic life. The majority of the government-owned sewage treatment plants remain closed most of the time due to improper design or poor maintenance or lack of reliable electricity supply to operate the plants, together with absentee employees and poor management. According to a World Health Organization study, out of the India's 3,119 towns and cities, just 209 have partial sewage treatment facilities, and only 8 have full wastewater treatment facilities. Over 100 Indian cities dump untreated sewage directly into the Ganges River. Investment is needed to bridge the gap between 29000 million litre per day of sewage India generates, and a treatment capacity of mere 6000 million litre per day.

Toxic pollutants

Every year 25 billion pounds of toxic pollutants are added to the environment by factories and mines (Fagin & Lavelle, 1999). Additionally, 2.2 billion pounds per year of pesticides (eight pounds per citizen) are sprayed on our crops (Natural Resources Defense Council Staff, 1995). Annual world production of synthetic organic chemicals has grown exponentially since the early 20 century. The vast majority of artificial chemicals have never been screened for toxicity. Chemical manufacturers are not required to prove safety; instead the legal burden is on the government to prove that a product is dangerous, and testings only done after a substance has been impugned. Certain pesticides that are illegal in the United States are used in other countries on food which is then imported back into the US, exposing Americans to the same health risks faced by individuals in those other countries (Satcher, 2000).

Two million children in the United States are at risk of neurological damage due to elevated lead levels (Hattam, 1998). Other toxic pollutants include dioxin, a by-product of the manufacturer of defoliants such as "Agent Orange", which is currently produced largely as a byproduct of medical incineration of polyvinyl chloride in intravenous bags and tubing; polychlorinated biphenyls; nitrates and nitrites, mercury and methylmercury; arsenic; trichloroethylene; and vinyl chloride. "Agent Orange" has been lined to diabetes, chloracne, porphyria cutanea tarda, soft-tissue carcinomas, multiple myeloma, and lungand prostate cancers (Maugh, 2000). Forty-five million US citizens live within 4 miles of one of the 1193 Superfund sites (Pope, 1994). These sites, as well as waste dumps and incinerators, are more common in lower socioeconomic status neighborhoods, such as the "Cancer Belt" between Baton Rouge and New Orleans, Louisiana (Mackillop, Zhang-Salomons,)

Fertilizers and pesticides used in agriculture in northwest have been found in rivers, lakes and ground water. Flooding during monsoons worsens India's water pollution problem, as it washes and moves all sorts of solid garbage and contaminated soils into its rivers and wetlands.

Deforestation

Tropical forest constitutes seven percent of world land surface area, yet contains over 50% of all plant and animal species. Half of all tropical forests have been destroyed; by 2010, three-quarters may be lost. Additionally, 20–50% of global wetlands have been destroyed (54% thus far in the US, with an additional 115,000 acres/year), (Sierra Club Staff, 2000). Loss of old growth forest has recently particularly affected the Pacific Northwest and British Columbia, known as the "Brazil of the North", an allusion to the devastation wrought by the unsustainable, rapacious logging practices of multinational corporations in the Amazon.

Solid waste pollution

Trash and garbage is a common sight in urban and rural areas of India. It is a major source of pollution. Indian cities alone generate more than 100 million tons of solid waste a year. Street corners are piled with trash. Public places and sidewalks are despoiled with filth and litter, rivers and canals act as garbage dumps. In part, India's garbage crisis is from rising consumption. India's waste problem also points to a stunning failure of governance.

In 2000, India's Supreme Court directed all Indian cities to implement a comprehensive waste-management programme that would include household collection of segregated waste, recycling and composting. These directions have simply been ignored. No major city runs a comprehensive programme of the kind envisioned by the Supreme Court.

Indeed, forget waste segregation and recycling directive of the India's Supreme Court, the Organisation for Economic Cooperation and Development estimates that up to 40 percent of municipal waste in India remains simply uncollected. Even medical waste, theoretically controlled by stringent rules that require hospitals to operate incinerators, is routinely dumped with regular municipal garbage. A recent study found that about half of India's medical waste is improperly disposed of.

Municipalities in Indian cities and towns have waste collection employees. However, these are unionised government workers and their work performance is neither measured nor monitored.

Some of the few solid waste landfills India has, near its major cities, are overflowing and poorly managed. They have become significant sources of greenhouse emissions and breeding sites for disease vectors such as flies, mosquitoes, cockroaches, rats, and other pests.

In 2011, several Indian cities embarked on waste-to-energy projects of the type in use in Germany, Switzerland and Japan. For example, New Delhi is implementing two incinerator projects aimed at turning the city's trash problem into electricity resource. These plants are being welcomed for addressing the city's chronic problems of excess untreated waste and a shortage of electric power. They are also being welcomed by those who seek to prevent water pollution, hygiene problems, and eliminate rotting trash that produces potent greenhouse gas methane. The projects are being opposed by waste collection workers and local unions who fear changing technology may deprive them of their livelihood and way of life. Along with waste-to-energy projects, some cities and towns such as Pune, Maharashtra are introducing competition and the privatization of solid waste collection, street cleaning operations and bio-mining to dispose the waste. A scientific study suggests public private partnership is, in Indian context, more useful in solid waste management. According to this study, government and municipal corporations must encourage PPP-based local management through collection, transport and segregation and disposal of solid waste.

Global Warming

"The foremost evidence for worldwide climate change has been global warming." It is one of the important factors contributing to environmental degradation and disasters. Evidence indicates that the Earth's climate system is warming in a way that has no precedent in the history of human civilization. The continuing temperature acceleration might break the balance of a human ecosystem that has been long established at a lower temperature." The latest report of the IPCC estimates a rise in the global average surface temperature from 1990 to 2100 of between 1.8° C and 4° C, although it could possibly be as high as 6.4° C. The sea level has risen between 1993 and 2003 at a rate of 3.1 millimeters per year due to melting polar ice caps and seawater expansion (due to warmer climate); rainfall patterns have been changing with increased droughts in some areas and heavier rain in others; glaciers and snow melting have been increasing water in rivers at certain times; winds are increasing in power and cyclones are shown to be increasing in frequency; and ocean temperatures have been rising.

Global warming is likely to influence the average weather patterns by gradual changes in weather patterns and "increased variability of extreme weather events associated with changes in surface temperature and precipitation. In the last few decades, ninety percent of natural disasters have been caused by climate-related natural hazards; and there is scientific evidence that most of them have their roots in global warming. The effects of warming and drying in some regions will reduce agriculture potential and undermine "ecosystem services" such as clean water and fertile soil.65 Thus, the environmental impacts as a result of global warming have a deleterious effect on the living environment of large populations, which ultimately leads to mass migration.

Drought, Desertification, and Water Scarcity

Drought and water scarcity is the third main climate change impact that may significantly contribute to climate-related migration. Droughts, desertification, and water scarcity are likely to increase because of global warming. These phenomena are projected to affect about one-third of

the world's current population. Droughts are likely to displace millions of people all over the world, affecting food insecurity and human livelihoods. Sea level rise will extend areas of salinization of groundwater and estuaries, resulting in a decrease in freshwater availability for humans and ecosystems in coastal areas. Moreover, changing precipitation patterns create pressures on the availability of clean water supplies.

Overview of results

To summarize, the following factors were found to be prominent in the environmental degradation. In a majority of the studies discussed above, we found that activities by the rich and powerful were the primary contributing factors forcing groups living at the margins into environment degradation. Environmental degradation poses a significant threat to human health worldwide. Harmful consequences of this degradation to human health are already being felt and could grow significantly worse over the next 50 years. Because environment and health are so intimately linked, so too should be environmental and health policies. It is an area of research which has had little empirical work done to date and offers the potential for substantial work in the future.

References:

"Drowning in a Sea of Garbage". The New York Times. 22 April 2010.

"Environment Assessment, Country Data: India". The World Bank. 2011.

"Evaluation Of Operation And Maintenance Of Sewage Treatment Plants In the India-2007". Central Pollution Control Board, Ministry of E.

"Global Forest Resources Assessment 2010". FAO. 2011.

"India: Country Strategy paper, 2007–2013". European External Action Service, European Union. 2007.

"ISDR: Terminology". The International Strategy for Disaster Reduction. 2004-03-31. Retrieved 2010-06-09.

"The Edicts of King Ashoka (also, see other translations)". Buddhist Publication Society. 1994.

"The Little Green Data Book". The World Bank. 2010.

Alberini, A.; Cropper, M.; Fu, T.T.; Krupnick, A.; Liu, J.T.; Shaw, D.; Harrington, W. Valuing health effects of air pollution in developing countries: the case of Taiwan. *J. Environ. Econ. Manage.* **2006**, *34*, 107-126.

Alberini, A.; Hunt, A.; Markandya, A. Willingness to pay to reduce mortality risks: evidence from a three-country contingent valuation study. *Environ. Resour. Econ.* **1997**, *33*, 251-264.

Amicus Journal Staff (1999b). Natural resources defense council staff. Exxon Valdez (ten years later).

Antony Trewavas: "Malthus foiled again and again", in *Nature* 418, 668–670 (8 August 2002), retrieved 28 December 2008

Aunan, K.; Patzay, G.; Aaheima, H.A.; Seip, H.M. Health and environmental benefits from air pollution reductions in Hungary. *Sci. Total Envir.* **1998**, *212*, 245-268

Chertow, M.R., "The IPAT equation and its variants", *Journal of Industrial Ecology*, 4 (4):13–29, 2001.

Desaigues, B.; Rabl, A.; Ami, D.; My, K.B.; Masson, S.; Salomon, M.A.; Santoni, L. *Monetary Valuation of Air Pollution Mortality: Current Practice, Research Needs and Lessons from a Contingent Valuation*; Universite de Strasbourg: Strasbourg, Alsace, France, 2004.

Environmental Issues, Law and Technology – An Indian Perspective. Ramesha Chandrappa and Ravi.D.R, Research India Publication, Delhi, 2009, ISBN 978-81-904362-5-0

Faulkner, L. R., & McCurdy, R. L. (2000). Teachingmedical students social responsibility: The right thing to do. Academic Medicine, 75, 346–350.

Frederick, Kenneth D., and David C. Major. "Climate Change and Water Resources." Climatic Change 37.1 (1997): p 7-23.

Ganguly et al (2001). "Indoor Air Pollution In India – A Major Environmental And Public Health Concern". Indian Council of Medical Research, New Delhi.

Hammit, J.K.; Zhou, Y. The economic value of air-pollution-related health risks in China: a contingent valuation study. *Environ. Resour. Econ.* **2006**, *33*, 399-423.

Henrik Urdal (July 2005). "People vs. Malthus: Population Pressure, Environmental Degradation, and Armed Conflict Revisited". *Journal of Peace Research* **42** (4): 417–434. doi:10.1177/0022343305054089.

Huesemann, Michael H., and Joyce A. Huesemann (2011). *Technofix: Why Technology Won't Save Us or the Environment*, Chapter 6, "Sustainability or Collapse?", New Society Publishers, ISBN 0865717044.

Johnson, D.L., S.H. Ambrose, T.J. Bassett, M.L. Bowen, D.E. Crummey, J.S. Isaacson, D.N. Johnson, P. Lamb, M. Saul, and A.E. Winter-Nelson. 1997. Meanings of environmental terms. Journal of Environmental Quality 26: 581–589.

Klement Tockner and Jack A. Stanford (2002). "Riverine flood plains: present state and future trends". *Environmental Conservation* **29** (3): 308–330.doi:10.1017/S037689290200022X.

Konikow, Leonard F. "Contribution of Global Groundwater Depletion since 1990 to Sea-level Rise." Geophysical Research Letters 38.17 (2011).

Li, J.; Guttikunda, S.K.; Carmichael, G.R.; Streets, D.G.; Chang, Y.S.; Fung, V. Quantifying the human health benefits of curbing air pollution in Shanghai. *J. Environ. Manage.* 2004, *70*, 49-62.

Maureen Cropper; Charles Griffiths (May 1994). "The Interaction of Population Growth and Environmental Quality". *The American Economic Review* 84 (2): 250–254.

Milind Kandlikar, Gurumurthy Ramachandran (2000). "2000: India: The Causes And Consequences Of Particulate Air Pollution In Urban India: A Synthesis of the Science". *Annual Review of Energy and the Environment* **25**: 629–684.doi:10.1146/annurev.energy.25.1.629.

Ragab, Ragab, and Christel Prudhomme. "Soil and Water: Climate Change and Water Resources Management in Arid and Semi-Arid Regions: Prospective Challenges for the 21st Century." Biosystems Engineering 81.1 (2002): p 3-34.

Raleigh, Clionadh, and Henrik Urdal. "Climate Change, Environmental Degradation, and Armed Conflict." Political Geography 26.6 (2007): 674–94.

Selden Thomas M. and Song Daqing (1994). "Environmental Quality and Development: Is There a Kuznets Curve for Air Pollution Emissions?". *Journal of Environmental Economics and Management* **27** (2): 147–162. doi:10.1006/jeem.1994.1031.

Simon J.L. 1981. The ultimate resource; and 1992 The ultimate resource II.

Steve Hamnera et al.; Tripathi, Anshuman; Mishra, Rajesh Kumar; Bouskill, Nik; Broadaway, Susan C.; Pyle, Barry H.; Ford, Timothy E. (2006). "The role of water use patterns and sewage pollution in incidence of water-borne/enteric diseases along the Ganges river in Varanasi, India". *International Journal of Environmental Health Research* **16** (2): 113–132. doi:10.1080/09603120500538226. PMID 16546805.

Sushil and Batra; Batra, V (December 2006). "Analysis of fly ash heavy metal content and disposal in three thermal power plants in India". *Fuel* **85** (17–18): 2676–2679.doi:10.1016/j.fuel.2006.04.031.

The Amicus Journal, Summer, 10. Amicus Journal Staff (1999c). Sprawl: A twentieth-century plague.

The Amicus Journal, Summer, Amicus Journal Staff (2000a). Natural resources defense council staff. Arsenic and old laws. The Amicus Journal, Summer, 44.

Wang, Y.; Zhang, Y.S. Air quality assessment by contingent valuation in Ji'nan, China. *J. Environ. Manage.* **2009**, *90*, 1022-1029.

Water." Climate Institute. Web. Retrieved 2011-11-03.

Young, Gordon J., James Dooge, and John C. Rodda. Global Water Resource Issues. Cambridge UP, 2004.

Copyright © 2014 by Academic Publishing House Researcher



Published in the Russian Federation European Researcher Has been issued since 2010. ISSN 2219-8229 E-ISSN 2224-0136 Vol. 81, No. 8-2, pp. 1499-1513, 2014

DOI: 10.13187/er.2014.81.1499 www.erjournal.ru

Economic sciences

Экономические науки

Clean Coal Initiatives in India

Sribas Goswami

Department of Sociology, Serampore College, West Bengal, India PhD, Assistant Professor E-mail: sribasgoswami@gmail.com

Abstract

Availability of, and access to, coal is a crucial element of modern economies and it helps pave the way for human development. Accordingly, the thermal power sector and steel industries have been given a high priority in the national planning processes in India and a concerted focus on enhancing these sectors have resulted in significant gain in generation and availability of electricity and steel in the years since independence. To meet the need of huge demand of power coal is excavated. The process of excavation to the use of coal is potential enough to degrade the environment. Coal Mining is a development activity, which is bound to damage the natural ecosystem by all its activities directly and ancillary, starting from land acquisition to coal beneficiation and use of the products. Huge areas in the Raniganj and Jharia coal field in India have become derelict due to abandoned and active opencast and underground mines. The study is pursued to illustrate the facts which show the urgent need to clean coal mining in India.

Keywords: clean coal; environmental degradation; health hazards; mine fire; pollution.

Introduction

Burning coal produces about 12 billion tons of carbon dioxide each year which is released to the atmosphere, about 70% of this being from power generation. Coal is the most abundant source of energy in the world and will be continued to be used as the major feedstock for electricity production for at least the next 30-40 years. Currently, the power sector consumes about 80% of the coal produced in India (Eleventh plan report-2007-12). As the demand for electricity is expected to rise dramatically over the next decades, coal will persist to be the dominant energy source. Clean coal initiatives are those which facilitate the exploitation and utilization of coal economically and eco-friendly manner, keeping emission of greenhouse gases within sustainable limit of the earth. A basic approach to the clean coal initiative is to mine coal with minimum quality dilution, prepare the coal to segregate waste rock and stow it back below the earth crust; transport the coal with minimum vehicular exhaust, noise and use it for industrial purposes with high fuel efficiency, minimum generation of waste matters and greenhouse gases. The inefficiency of mining and coal preparation in India are manifested during combustion not only in form of inefficient power plants but also heavy emission of pollutants damaging even the ozone layers. Increasing



demand for environmental quality, protection of greenery, clear air and water, minimization of noise congestion and open space for active outdoor recreation have all taken with key importance. An impact of coal mines can be defined as any change in physical, chemical, biological, cultural, socio-economic and environmental system that can be attributed to human activities.

Raniganj and Jharia coal mining region plays an important role in India's economic development. This region has well developed transport and communication and rich mineral resources. This famous coal bearing region has got very well scope for large industrial development along with other kinds of developments such as agriculture, livestock, forest, water and other minerals. Therefore an integrated approach is very necessary for sustainable development in this region. It is thus clear that coal mining leads to environmental damage, while economic development and self-reliance call for the increase in mining activities of the available mineral resources. Though there is no alternative to the site of mining operations, options as implementation of clean coal technology, adaptation of eco-friendly coal mining process and aforestation around the mining site etc. can really minimize the damage to the environment.

Sources of data & method of study

The present study is an empirical research conducted in two major coalfields namely Raniganj Coalfields and Jharia Coalfields in India. Raniganj coalfield has one subsidiary company of coal India, ECL (Eastern Coalfields Ltd) and Jharia coalfield has two subsidiaries, BCCL (Bharat Coking Coalfield Ltd) and CCL (Central coalfields Ltd). The methodology of the present study includes collection of research material over the field study and direct observation methods. The present research is based on both primary as well as secondary data. Primary data have been collected from a structured interview schedule with the officers and workers of Coal India Ltd. and secondary data have been collected from CMPDI (Coal Mining Planning And Design Institute) records, monthly journals of IICM (Indian Institute of Coal Management), books and research paper related to coal mining. The field study was conducted from the Coal India Headquarters in the year of 2013.

Several aspects of environmental degradation in coalmining areas in India

The environment of underground mines have been a subject of serious concern in the mine operators because of the liberation of methane with coal cutting, heat, humidity and generation of fumes with the blasting of coal (Wathern, 1988). The opening of the coal seams with interconnecting galleries, coursing for intake and return air, creation of air draught and deployment of auxiliary or forcing fans are some of the conventional means adopted to improve the environment of underground. The dust or suspended participate matter is suppressed by water spraying from the loading or transfer points. In the subsequent years water infusion in the seams and water jet mounting on the cutting edges is tried to minimize dust menace during cutting of the coal.

The auto oxidation of the coal; a slow process is aggravated when large surface area of the fine coal particles come in come in contact of air. The oxidation of pyrite adds a new dimension to the problem and being an exothermic the process causes spontaneous heating and fire in underground under favorable conditions. The heating process generates SO_2 , CO, CO_2 and higher hydrocarbons (Boliga, 2010). These gases reach to the atmosphere through cracks and fissures make the underground environment unsuitable for the miners and also pollute the surface atmosphere around the up cast channels. Similarly the blasting underground generates NO_x and other gases in addition to fine particulate matter. The atmosphere of underground and surface is affected by number of mining activities like cutting, blasting, coal loading, transport and preparation to beneficiation on the surface. The factors responsible for generating and adding different pollutants and greenhouse gases in the atmosphere are shown in the following figure. The most damaging constituent among them are the suspended particulate matter, transport and preparation of coal, the methane releases from the coal seams and burning of coal produces greenhouse gases.

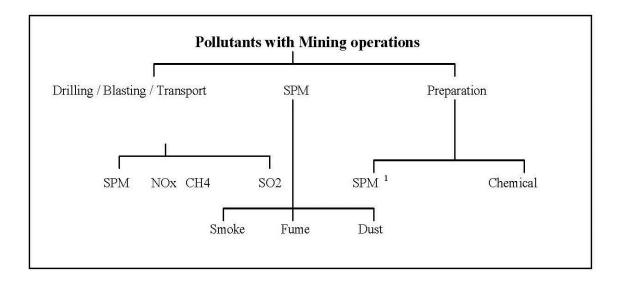


Fig. 1: Atmospheric pollutants with different mining operations in Ranigani and Jharia coalfields

Some of the pollutants are the natural product of the coal formation while a number of them are produced during the mining operations, preparation and handling of coal mines. The underground mining technology has been developed in different parts in the country to improve the surrounding environment and to minimize hazards associated with different mining activities.

Raniganj and Jharia coalfields most of the time is covered by smoky air containing several invisible poisonous gases and micro particles. So clean coal initiative should be taken effectively to protect the environment. Constantly developing series of technology solutions may improve the efficiency and environmental impact of using coal as an energy supply (Singh, 2012). They are following.

- 1. Beneficiating coal (pre-combustion) coal de-watering, coal washing and briquetting
- 2. Efficient unconventional uses of coal reserves UCG, coal seam methane
- 3. Effectiveness improvements of power plants (post combustion) Plant upgrades
- 4. Supercritical and ultra-supercritical plants.
- 5. Sophisticated technologies IGCC, PFBC and IGFC
- 6. Super-Advanced Technologies Carbon sequestration or elimination

Dust hazard in coalmining areas

The environment is under severe constraint because of the limited geometry of opening, number of simultaneous mining activities, liberation of gases from the coal seams and reaction of air with freshly exposed coal surface and pyrites. Typical result of dust concentration in the environment of mining regions is shown in the following table.

Table 1: Dust concentrations in the environment in mining regions in Raniganj and Jharia Coalfields

Production per day (ton)	Dust load dg* / day	Dust gm†/ton	Dust Concentration / mg [†]	Operation
300	9.5	32	2.7	Depillaring
180	2.9	17	0.5	Development
180	00.0	61.5	1.68	Road header
150	7.7	51.5	185	Scraper conveyor
120	4.1	34.5	1.2	Depillaring
90	0.54	6.0	0.16	Watery mine

Sources: CMPDI, Survey Report, 2013

Table 1 shows that maximum production creates maximum dust concentration in the air which is 2.7 mg per 300 ton coal production per day. Increasing demand for coal also increase the environmental vulnerability. The dust particles causing harmful effect are divided into inert and proliferate groups. The inert particles link stone and smoke soot do not impair lung function unless excessive deposition over years. Proliferate group of dust includes free or crystalline silica and coal dust. The silicosis gives rise to difficulty in breathing, reduction of chest expansion and susceptibility to tuberculosis is because of the silica dust. Coal dust causes focal emphysema and results in marked disability in advance stage. The disturbance in the lung function in the early stage of fibrosis results in reduction in breathing or ventilator capacity and impairment of the process of gas exchange. In either case, the change in function is associated with bronchitis or emphysema.

The dust concentration in the surrounding environment varies with the operation and location and quality of coal and natural moisture content of the mine environment. Typical findings for an Indian mine is summarized in the following table covering different operational sites (CMRS§ Annual Report-2013). All the measurements are taken with MRE 113a, Gravimetric Dust Sampler. The dust concentration is high in case of dry, soft coal with high ash content. The dust particles size under suspension varies from 1.5 micron to below 10 microns being most crucial and responsible for pneumoconiosis amongst miners.

Table 2: Underground dust concentration during different mining operations in Ranigani and Jharia Coalfields

Operations	Dust concentration mg/m³ of air
Tub loading	1.93-2.85
Drilling	3.00-10.27
S D Loading**	5.00-6.25
Under cutting	8.00
Transfer points	2.73-2.86
Blasting	10.00-20.00

Sources: CMRS Annual Report, 2012-13

^{*} DG-Dust generator

[†] Gm- Gram

[‡] Mg- Magnesium

[§] CMRS- Coal Mining Research Standard

^{**} SDL- Side Discharge Loaders

For every ton of coal in underground mine, about 100 gm irrespirable dust is produced, out of which about 1-10% is air borne including 5 and 1 micron particles in the ratio of 1:40. The irrespirable dust generation in high rank coal seams or seams with higher ash content is proportionately more. The dust generation with the blunt cutting bits is also higher when the cutting is more under compression. Blasting produces the highest dust concentration in the air which is 10.00-20.00 mg/m. It also produces other kinds of poisonous gases.

Table 3: Irrespirable dust composition produced from underground mines in RCF* and JCF†

Operations	Sulfur %	Ash %	Free Silica %
Under cutting	0.49 (0.15-1.05)	20.94 (1.95- 57.05)	5.46 (1.56-13.32)
Drilling	0.56 (0.27-1.12)	15.70 (11.64- 20.63)	4.05 (2.67-7.71)
Blasting	0.41 (0.31-0.70)	19.0 (13.42- 32.67)	4.66 (2.09-2.27)
Loading	0.52 (0.31-0.70)	18.50 (14.81- 27.71)	4.37 (1.52-6.89)

Sources: CMRS Annual Report, 2012-13

In the report, nearly 0.56% sulfur, 15.70% ash and 4.05% silica of irrespirable dust is produced per meter of 43mm diameter hole drill in coal seams during 2012-13. Mechanized cutting of coal, concentrated heavy production, movement of heavy machine and low velocity of the air are responsible for high concentration of air borne coal and silica dust. The problem in case of long wall and continuous mining is being tackled by the use of sharp bits, use of dust extractor and directional clearance of dust improve air quality.

Dust concentration in coalmining areas in Raniganj and Jharia Coalfields.

The dust concentration in the coal mining area is one of the worst menace affecting the local residents and miners alike. The miners from the organized sector get health support and other medical facilities while the common citizens suffer without any such insurance. Major portion of the menace is indirect; associated with open stock burning of coal, dumping, of the waste rock and road transport of coal and sand. The suspended particulate matter in mining atmosphere of both coalfields is self revealing in this regard. The predominant air emission source in most of the coalfields is road generated dust and vehicular exhaust. In some of the areas road transport is the only mode of coal movement where open, leaky, inefficient trucks and dumpers carry coal on ill maintained roads and pollute the region. In Jharia coalfield, the vehicular movement contributes nearly 47% of total SPM load while the direct contribution of the underground mining is estimated to be 6% only (CMPDI report-2013).

Table 4: Suspended particulate matter (SPM) in coal mining areas in JCF

Location	SPM	Level –Microgram/m³
Mining cum residential area	801	(664-910)
Do (in rainy season)	480	(288-802)
Town residential area	786	(585-1010)

^{*} Ranigani Coalfields

† Jharia Coalfields

Do (in rainy season)	491	(147-713)
Average	618	-

Sources: CMPDI Survey Report, 2013

The ambient air quality of the mining area often polluted by the associated activities is of the non mining origin but of public concern and requires remedial steps. The vehicular discharge engages for the transport and handling of the coal within the coalfield is responsible to a large extent in adding suspended particulate pollutants to the atmosphere. The concentration of suspended particulate matter in ambient air of the coalfield on an average is high and the extreme reaches up to 1464 mg/1 in mining areas. The trace elements are also reported as pollutant in ambient air of Jharia coalfield, including Lead, Manganese, Arsenic Chromium and Cadmium (CMPDI report-2013). Table 4 shows that the residential area surrounded by coal mines are badly affected by the high concentration of SMP (801) which is 664-910 microgram/m3. The average concentration of SPM is also reaches the danger level of pollution which is 618.

Dust concentration in mine fire area

Depillaring or partial extraction of thick coal seams under shallow depth cover has caused cracks traversing the overburden. This has been facilitated breathing of air to the seat of coal resulting in spontaneous heating and fire. The underground coal mine fires are the common picture in Jharia and Raniganj coalfields. The record of coal mine fires are available for Raniganj even before 1869 and Jharia coalfield since 1916. In the process of burning from coal to surface grass is burnt with smoke all around resulting rise in temperature of the surrounding area. Jharia coalfield alone has over 70 active fires extended over 17.5 sq km emanating huge amount of noxious gases including poisonous CO to the atmosphere. The occurrence of fire in underground mines in Jharia coal field has devastating impact over the atmosphere due to release of Hydrocarbons, SO₂ and other gases from the coal mass with the rise in temperature. The ambient air pollution near mine fire area of Jharia coalfield is given bellow in the following table.

Table 5: Presence of gaseous pollutants in air of Jharia coalfield

Site Area / Collieries	Sulfur Jan	r dioxide (µg/m³) March Nov		Ni: Jan		ide (µg/m³) Aarch Nov
Dhansar	97 (170)	49 (128)	63 (107)	70 (109)	40 (92)	54 (95)
Sindri/ Tasra	89 (180)	39 (108)	68 (143)	53 (130)	37 (108)	38 (65)
Godhur/ Kusunda	152 (250)	65 (139)	76 (160)	54 (89)	38 (74)	47 (87)
Nirsa/ Kumardhubi	80 (173)	49 (83)	71 (173)	60 (103)	38 (45)	58 (125)

Sources: CMRI Report, 2013.

The carbon mono-oxide concentration in ambient atmosphere of Jharia coalfield varies within 787-893 $\mu g/m^3$ in winter season. The concentration of CO is attributed to active fire in this coalfield. If we look at the table 5 the presence of SO_2 & NO_2 in the air during January is high in all collieries.

Table 6: Annual rate of increase of greenhouse gases in RCF & JCF

Radioactive gases	Approx. Average Annual increase (%)
Carbon dioxide	0.4
Methane	1.3
Nitrous oxide	0.3
Frepm – 11	5.0
Methyl	10.0

Sources: CMPDI Survey Report, 2013.

Table 6 shows how the rate of emission of greenhouse is increasing day by day to the dangerous level. Raniganj and Jharia coalfields both are potentially harmful for producing the obnoxious gases. The annual rate of CO₂ emission is increasing 0.4% every year in these coalfields. So far emission of Methane is concern it is also increasing heavily with a rate of 1.3% per year. Methyl is contributing highest to the atmospheric pollution with an increase of 10% per annum.

At present, the contribution of carbon dioxide to global warming is roughly 50%. The other 50% is due to the other gases, such as methane, nitrous oxide and chlorofluorocarbons. The pollutants from coal combustion are mainly CO₂ and NO₂ become increasingly oxidized in the atmosphere. This causes increase in the acidity of rain water. Dry deposition of collected SPM over trees is clearly visible in mining areas. In the day time these particles increases the temperature of leaves. The soft part of the leaf cannot sustain the increased temperature and ultimately it loses the fertility and growth. This phenomenon is very common near the opencast mines and the power generation plants. Greenhouse effect is caused by excess CO₂ in the atmosphere which is the result of extensive burning of coal and accelerated deforestation during the past decade in these regions. These facts show the need for clean coal mining in India.

Surface atmospheric pollution in coalmining region in Raniganj and Jharia

Mining below the surface destabilizes the ground, while the process of mining particularly blasting under shallow cover causes surface structure vibration and noise menace. The transfer of the raw coal, its beneficiation and handling generates coal dust and open burning of coal for steam or other usage releases gaseous pollutants to the surface atmosphere. The movement of coal from the pit head to the loading or consumption points in open leaky trucks or open wagons also adds coal dust to the environment all along the route. The dump of the waste rocks, discharge of effluents from the machines and pumping out of the hard polluted water to the surface water sources make surface water unfit for mass consumption. The incidence of surface subsidence due to caving or fire damages the surface structures and endangers the surface dwellers around Ranigani and Jharia coalfields. The underground mines are ventilated by large size fans discharges polluted underground air up to 12,000 m³ /min of 3m to 5m diameter at over 200mm pressure (CMPDI Report, 2013). The air absorbs moisture from the underground mines often reduces the suspended particulate matter but the fumes of explosives, Methane, SO₂, and Oxides of Carbon are added to the atmospheric air. The concentration of these hostile gases often creates a little impact over the surface and the population nearby mine area. With the latest study about the impact of these green house gases over the Ozone layer has drawn the attention of the global community and efforts are to made on to drain methane and put it to use as a fuel here. The biodiversity and the local populace are also disturbed by the mining activities though they are mostly underground (Dhar, 2000).

Impact of underground mining on surface domain

Most of the lands acquired for the mining purpose are interior barren land, agricultural farms, or government controlled fallow and forest cover in Raniganj and Jharia. The development of the underground as well as opencast mining establishments, residential complex and civic amenities requires nearly 10% of the total surface area which has been developed at the cost of forest, farms, or fallow land (Dhar, 2000). These lands are used for the common facility

development with the marginal disturbance to the soil cover and green carpet. However the natural biological diversity of the mining area either are driven out or disturbed with the human settlement, noise nuisance in mining area which has been created by heavy vehicles and construction of jungle of concrete. With the cutting of the exotic plants the natural plant succession of the area is hindered and the loss of the green cover followed soil erosion.

The concentrated underground mining of coal in and around Jharia and Raniganj town has transferred the underground pollutants to surface atmosphere. The mine exhaust through main ventilators and the return airways has added the gaseous and particulate pollutants to the surface atmosphere. Weathering of the coal and rock mass, leachets from the dumps and noise menace from blast wave and movement of surface handling plants pollute the surface environment to variable degrees.

Change in land use pattern due to mining activity

The coal mining has created land degradation because of surface subsidence, solid waste and coal dumping, underground fire and silting of the surface. The disturbance of the aquifers and subsurface water table follows loss of green cover and vegetable mass. The subsidence and disturbance of hydraulic regime has been dealt separately because of their importance. The bunker in these coalfields have been very poor and the excavated coal is stocked openly along the railway siding. In the off seasons the pit head stock varies up to the production level of 15 days in a month covering a large area. The green cover over the patch is lost and the dust pollutes the area under the influence of underground mining and fire, affecting even the local non mining population. The waste rocks are picked and scattered around creates severe eye shore. The surface condition of Jharia coalfield is self revealing.

As the size, shape and magnitude of the dumps varies with demand, the land degradation under its influence is variable. Nevertheless, an area once under coal heap remains permanent eye shore unless is reclaimed by systematic plantation.

The other factors are responsible for the degradation of land in the coalfields of Raniganj and Jharia. The subsidence in normal cases has caused undulation of the surface, damage to the structures and drainage pattern. In case the slope exceeds 15 degrees, erosion of the soil occurs; usually the top soil is removed with torrential rains. This converts the farms to wasteland of low fertility and causes siltation of the dams, streams and ponds. According to an estimate, over 5.5 million hectares of land are already converted to waste land in Damodar valley alone (Goswami, 2013).

Table 7: Degraded area in *Damodar* valley in Raniganj and Jharia Coalfields due to coal mining

Type of degradation	Area in sq.km in coal mining subsidiaries				
Type of degradation	ECL	BCCL	CCL	Total	
Subsidence	29.4 (43.6%)	34.97 (51.8%)	3.08 (4.6%)	67.45	
Fire	5.88 (23.4%)	17.32 (68.8%)	1.96 (7.8%)	25.16	
Abandoned mines/dumps	4.42 (25.3%)	10.67 (61.0%)	2.40 (13.7%)	17.49	

Sources: CMPDI Survey Report, 2013.

Land Disturbance due to mining activity

Leaseholds for the underground mines are procured from the land lords who have granted coal mining authority the right for underground coal. The land for houses, dwellings and the associated activities are purchased piecemeal from different sources while large portion of the surface right remains under the control of farmers and landlords. Underground mining in these

areas are conducted with full responsibility of the surface protection by the operators who normally maintains pillars as the natural support to the surface features. Now the condition is very damaging under the Raniganj coalfield where thick coal seams are worked under shallow cover. There are some pockets in the coalfield which have subsided by over 10m due to repeat depillaring activities. In geologically disturbed areas, deep pot holes are formed through which valuable fertile soil is drained to underground and several times surface structures are damaged, distorted or spoiled.

The land of Jharia coalfield is under regular threat because of mining operation; failure of pillars and stocks, pillar crushing and advancing fire in adjacent pockets. The story of Ranigani coalfield is in no way different where nearly 4000 hector of land have been subsided up to the year 2011. The impact of underground coal mining in terms of loss of agricultural land is estimated to be nearly 1000 hector in Jamuria, Asansol and Kulti blocks of Raniganj coalfield until today. Thus the way coal mining is going on in this region has tremendous negative impact over socio-economic structure locally and damage to the environment has far reaching consequences.

Water pollution due to mining activity

As we are discussing serially the impact of coal mining on environment, the pollution of water due to mining needs to be discussed extensively. The hydraulic cycle starting from ocean to sky and ultimately precipitation to the earth is no exception for these coalfields where the rain, natural moisture and surface to subsurface water sustain biodiversity of the region. The infiltrated water is charged to the coal measure aquifers and is retained by the aquiclude or aquifuge. Depending upon the thickness, porosity, permeability and storage coefficient of the rock mass, the capacity of the aquifers varies extensively over Damodar valley to Pench Kanhan coalfields. The coal seams are known to be impervious, restrict the cross infiltration when different layers charge along the exposure serve as the confined aguifers. The extraction of the coal has followed disturbance of the aguifers and lowering of the water table. In this process mineral leaching occurs, affecting the water quality of underground. The water pollution problems in mining may be broadly classified into the following four major heads (Chadwik, 2007).

- Acid mine drainage due to sulfur content
- Deoxygenating and Eutrophication of coal
- Hardness of water due to leached
- Heavy metal pollution oil, tan and grease mixing in water

The mine effluents have high level of dissolved Chlorides, Nitrates, Phosphates or Sulfates of Sodium, Calcium Magnesium and Iron. At low levels, Nitrates, and Phosphates act as nutrients, causing rapid growth of algae and subsequent deoxygenating while at higher level, the character of the water is altered with deleterious effect over the fishes. The bicarbonates, Sulfates, Chlorides and Calcium and Magnesium cause hardness of the water and make it unsuitable for industrial and human consumption. The characteristic of the mine water of Jharia coalfield in different seasons is summarized in the following table.

Table 8: Average characteristic of mine water in Jharia coalfield				
Parameters	Winter	Summer	Rainy season	
Temperature (C)	30.5	26.8	29.5	

Parameters	Winter	Summer	Rainy season
Temperature (C)	30.5	26.8	29.5
pH value	8.5	7.4	8.0
Alkalinity:	-	-	-
Phenolphthalein mg/1	32.6	21.3	48.6
Methyl orange mg/1	224.3	256.8	283.8
Total Hardness mg/1	483.6	400.9	487.1
Permanent mg/1	314.2	256.2	413.2
Temporary mg/1	169.4	144.7	74.8
Chlorides mg/1	43.6	60.5	35.5
Sulfates mg/1	180.4	73.1	28.2

Phosphate mg/1	141.7	114.6	87.8
Suspended solids mg/1	119.3	111.8	161.4
Dissolved solids mg/1	558.2	497.7	698.1
Chemical Oxygen Demand mg/1	14.8	21.5	37.7
Iron mg/1	2.1	2.2	2.6

Sources: CMPDI Report, 2013.

Noise pollution due to mining activities

The noise is now being recognized as a major health hazard resulting annoyance. Cases of partial hearing loss and even permanent damage to the inner ear after prolong exposure are noticed. The problems of underground are of special importance because of the acoustics of the confined space. The ambient noise level of the mining area is affected by the operation of the cutting machines, tub/conveyor movement and blasting of the coal. The movement of heavy machines and transport units-conveyor, tubs to transfer points creates heavy noise pollution and disturbing the entire population specially in opencast mining regions (Singh. 2012).

Table 9: Noise level in Raniganj coalfields

Location of survey	Average Noise level (dB)*
Near shearer	96
Transfer point	99
Tail end belt conveyor	89
Power pack pump	91

Sources: Director General of Mine Safety Report, 2012-2013

Table 10: Noise survey in selected coal mines in Raniganj coalfields

Type of mine	Machine points	Noise Level	Duration of Operation		
Wholly manual Mechanized	Drill Tagger haulage	87 dB (A) 105 dB (A)	1-2 hrs 4 hrs		
With CCM cutting	CCM [†] Drill Auxiliary fan	94 dB (A) 94 dB (A) 93 dB (A)	1 hr 1-2 hrs 8 hrs		
Mechanized loading	1 HI)+		2 hrs 4-5 hrs 4-5 hrs		

Sources: Director General of Mine Safety Report, 2012-2013

The mechanized mines have lower noise problem in comparison to the old conventional mines, operational mines operating with haulage and coal cutting machines. The results show that covering wholly manual, partly mechanized with coal cutting machines and partly mechanized with

Db- The decibel

CCM- Carousel Cutting Machine

[‡] LHD- Large Height Deviation

SDL* loading has been showed reduction in the noise level . As we know that if noise level exceeds 85 dB it becomes harmful for human health. The average noise level in Raniganj is higher than the permissible limit in and around coal mines.

The most noise generating equipments in coal mining in Raniganj are the haulage, ventilators-main, auxiliary and forcing fans, conveyor transfer points, cutting and drilling machines. Blasting also creates heavy noise in this region. The ambient noise level due to different operations in mines varies within 80-1040 dB (A) (Banerjee, 2007). In Raniganj and Jharia coal field the noise level near fan house, conveyor system shearer and road headers is reported to be within 92-93 dB (A). The degree of noise pollution is increased in many mines due to poor maintenance of the machines, which sometimes exceed the permissible limit of 85 dB (A) for 8 hours per day exposure. The transfer points of the coal in underground mining are the main points of the noise menace. The result of a noise survey for a coal mine conducted by DGMS[†] is summarized in the above table, which indicates noise reaches over 90 dB by the drills, breaking and crushing units and transport system in underground. The typical results show that the operation with Tagger haulage brings noise level 105 dB for 4 hour operation.

From the above discussion pollution of air, water and noise reaches to the danger level in these coalfields which have direct adverse impact on human health. The situation also demands the immediate initiative for clean coal mining in these regions.

Process of environmental rehabilitation in opencast and underground mines:

Coal is the major primary source of energy and has a share of about 60% in the national energy requirement. Besides, the coal is also used by the steel and other base manufacturing industries. It is rather ironical that the power grade coal, the prime source of energy is deposited in the forest areas. This immediately brings direct confrontation of coal exploitation with environment. Underground mining has its own damaging capacities which are responsible for emission of poisonous gases to the environment. But opencast mining degrades surface land has direct impact of socio-economic life of surrounding population. We have seen in the recent past the reaction regarding land acquisition for coal mining.

The perspective plan of the production programmes drawn for the 2005-2012 periods are given below:

Mine type	2005- 06	2006- 07	2007- 08	2008- 09	2009- 10	2010- 11	2011-12
Opencast (Million Tons)	168.33	177.33	190.60	199.84	210.82	274.45	403.74
Underground (Million Tons)	68.76	71.78	74.98	79.79	82.39	95.58	43.96
Total (Million Tons)	237.09	249.51	265.58	279.63	293.21	370.03	447.00

Table 11: Coal Production Programme (mining type wise) in Indian Mines

Sources: CMPDI Survey Report, 2013.

Though the above figures are rather indicative, the growth of opencast production in absolute terms will need opening of big new mines. This will in turn, have confrontation with the environment and will need effective rehabilitation measures for their environmental restoration. The opencast mines generally affect most of the environmental attributes. However the major concerned descriptors of the environment being affected are land, water, air, flora and fauna. The environment in an opencast mine in post-mining phase is as important as or rather more important than the operational phase. The importance of post-mining environment can be

*

^{*} SLD- Side Discharge Loaders

[†] DGMS- Director General of Mine Safety

comprehended since the post-mining scenario has become everlasting unless properly rehabilitated. The rehabilitation of the mined out areas and the OB or reject dumps assume special significance in the rehabilitation efforts in the post-operational period.

Table 12: Coking and non coking coal production in India

	Coal Production in Coal India Ltd									
	Fiscal year									
	2010		2011		2012		2013		2014 JAN	
Grad es	Raw coal production Million	% of Raw coal production	Raw coal production Million	% of Raw coal production						
Non Cokin g Coal 1	395.13	91.6	389.97	90.4	392.48	90.1	408.555	90.3	328.774	89.7
Cokin g Coal 2	36.13	8.4	41.35	9.6	43.36	9.9	43.656	9.7	37.796	10.3
Total	431.26	100.0	431.32	100.0	435.84	100.0	452.211	100.0	366.570	100.0

Source: https://www.coalindia.in/en-us/performance/physical.aspx

The above table shows the growth of production of coking and non-coking in India. The production of non-coking coal has been increased significantly over the years keeping the parity with demand for electricity. Some 23% of primary energy needs are met by coal and 39% of electricity is generated from coal. About 70% of world steel production depends on coal feedstock (Coal India web report, 2014). Coal is the world's most abundant and widely distributed fossil fuel source. Other estimates put carbon dioxide emissions from power generation at one third of the world total of over 28 billion tones of CO₂ emissions (Hill, 2003).

Impact of coal mining on human health in Raniganj and Jharia Coalfields:

Coal mining operations have resulted environmental degradation, ecological changes and are associated with health and safety of mine workers and surrounding population. The environmental hazards are dangerous for the mining community as they aggravate the problem of ill-health. Majority of the children suffer from moderate malnutrition and are found to have vitamin and iron deficiencies in particular. Mining communities, who have inferior access to balanced diet, easily falls prey to the chain of malnutrition, poor health and weakness which are prone to diseases. Polluted environment further aggravates the situation. Clean coal technologies are definition an answer to the above mentioned problems.

A new technology for clean coal mining is needed to combat environmental degradation and stresses on the working personnel associated with coal mining. A large section of the population in and around the coal mining area in *Damodar* Basin suffers from chronic water borne diseases. The population is mainly sufferer of intestinal parasitic infection, anemia, skin diseases, tuberculosis; succumb to diarrhea, weight loss and respiratory infection. The transition of the natural environment which has resulted in worsening of the situation can be tackled effectively with the help of sustainable development.

Table 13: Morbidity Pattern of Worker's Community in Coal Mines (2010-2012) Raniganj Coalfield and Jharia Coalfield

Type of Diseases	ECL		BCCL		
	No. of patient	%	No. of Patient	%	
Gastrointestinal disorder	4076	19.32	4289	21.52	
Respiratory disease	3224	15.28	3384	16.98	
Ear disease	629	2.98	622	3.12	
Skin disease	475	2.25	702	3.52	
Joint Pain	460	2.18	494	2.48	
Fever (Malaria, Filarial etc.)	3051	14.46	3113	15.62	
Anemia	4365	20.69	4461	22.38	
Injury	1401	6.64	861	4.32	
Cardiovascular diseases	722	3.42	630	3.16	
Other ailments	2696	12.78	1375	6.90	
Total	21099	100.00	19931	100.00	

Source: Personal survey from ECL & BCCL main hospitals -2013

Health issue is the key to progress of human development, whether for the individual or for the society. To achieve good health, pure food and improvement in nutritional condition is necessary. The quality of nutrition affects the well-being and immune capabilities of a person.

A personal survey is conducted in two different coalfields of *Damodar* river basin. From hospital records (table-13) and general survey it is found that people suffering from gastrointestinal diseases are high in both the areas due to water pollution and unhygienic conditions. People suffer from respiratory diseases because of air pollution in both areas. Besides the above mentioned types of diseases, it is observed that due to nutritional deficiencies anemia, skin diseases are commonly found among the mining population. But what is noteworthy is that, people living in unhygienic conditions and suffering form nutritional deficiencies and its effects is higher in one area in comparison to the other as observed in the above table.

Salient points of health technology proposed for coal mining community is briefly discussed below. Solid foundation must be laid early to lead a healthy life. Individual responsibility and self help must be of prime importance. Thus the emphasis has shifted from 'Health care for the people' to 'Health care by the people'. Food taken must be simple tasty, nutritious, variable and balanced. An individual's nutrition is linked with his health and development during childhood years. Thus children must be well-fed with suffer from polluted environment linked diseases. Grain-based diet can also have more nutritive value than meat-based diet. Flexibility and opportunism in diet are valuable. Drinking water must be clean. Simple rules of personal cleanliness must be observed and basic elements of health education must be followed.

Concluding remarks:

Clean coal mining initiative has become essential in view of extensive damage to the environment and ecology with the surface mining and even with underground mining. The ash content of the inferior coal with the surface mining is increasing with the size of earth moving machinery when the bands are worked along with the coal. Mining of gassy coal seams and its combustion for power generation are the major sources of methane and carbon dioxide. Mining below the surface destabilizes the ground, while the process of mining particularly blasting causes vibration of the surface structures and noise generation. The transfer of the raw coal, its beneficiation and handling generates coal dust, whiles open burning of coal for steam or other usage release gaseous discharge to the surface atmosphere. The movements of coal from the pit head to the loading, or consumption points in open trucks or open wagons also add coal dust to the environment all along the routes. The air absorbing moisture from the underground workings often reduces the suspended particulate matter but the fames of explosives, methane, SO₂, and Oxides of carbon are added to the general body of air. The concentration of these hostile gases often creates

negative impact over the surface and the population nearby. With the latest apprehension about the impact of these green house gasses over the ozone layer has drawn the attention of the global community and efforts are made to drain methane and put it use as a fuel.

The bio – diversity and the local people are also disturbed by the mining activities because opencast mining is increasing. Climate change is now given the highest priority in the list of global environmental problems. The gases and pollutants emitted by coal extraction and combustion are factors that interconnect energy security, air pollution and greenhouse effect. In order to understand the implications of the global greenhouse effect we need reliable information on the rate of emission of carbon dioxide and certain other trace gases as a result of coal extraction and burning in these areas. Energy security will figure as the main issue if there is to be concentrated effort to reduce the carbon dioxide emissions.

The scientists are of the opinion that before starting reclamation of subsided land, the purpose of reclamation in terms of "land-use" should be decided in consultation with the local people. The most important thing is to plug the cracks and it may not be necessary to bring the subsided land to original profile even for use for agriculture, plantation and housing. The human dimensions of these physical impacts have been marginalization of the poor tribal from the mainstream, formal economy, displacement of peasantry and the growth of small scale, informal, illegal coal mining under local initiative.

Commercial supercritical combustion technology is the best option for India in the short-to-medium term. While gasification and advanced combustion technologies will be potentially important options for the longer-term future, there are significant issues surrounding the current relevance of these emerging technologies for India, including uncertainties in technical and cost trajectory, suitability for Indian conditions, and timing of India's greenhouse-gas mitigation commitments. There are two benefits of clean coal mining. One is the probable immediate benefits including reductions in CO₂ emissions which result from using upgraded coals in existing power plant boilers. The other is the long-term benefits arising from the use of advanced clean coal technologies which may insist the use of upgraded coal anyway in order to apprehend their potential for increased thermal efficiency.

Enforcement and tighten local environmental pollution controls through better pollution control technologies, greater and meaningful public participation should be ensured to have clean coal mining in India. Solar-power satellites are a serious option for the future. Heat mining, wind energy and biogas can also become alternative sources of energy instead of coal.

References:

Coal India Limited, Government of India, Website- www.coalindia.gov.in, Pricing, Telecom Division, Coal India Limited, IT Manager, Kolkata, India, 2014.

Biswas, A.K and Q. Geping, ("Environmental Impact Assessment for Developing Countries": Tycolly International, London, 2007, pp. 232.

Boliga, B.P, "Challenges of environmental management", 4th National Convention of Mining Engineers, March, Dhanbad, India, 2010, Pp. 25.

Banerjee, S.P, "Land Reclamation in Mined Areas", National workshop on environmental management of mining operation in India- a status paper. February, Varanasi, 2007, pp. 63-73.

CMPDI Survey Report, 2013, pp. 12.

Chadwik, M.J, Environmental impacts of coal mining and utilization, Pergamum Press Oxford, 2007, pp. 5-211.

Coal Mining Research Standard (CMRS) Annual Report, 2013, India.

Coal India Annual report-2013, pp. 120

- Dhar, B.B, "Environmental impact and abatement of noise pollution", National Workshop on environmental management of mining operation, Varanasi, India, 2000, pp. 168-204.
- Goswami, S, "Need for Clean Coal Mining in India", Environmental Research, Engineering and Management, 2013. No. 4(66), 2013, pp.79-84
- Goswami, S, "Coal Mining, Environment and Contemporary Indian Society", Global Journal of Human Social Science, U.S.A (B), Volume 13 Issue 6 Version 1.0, 2013 pp. 17-26
- Government of India, (2007-12) Central Electricity Authority, 11th Plan Shelf of Thermal Power Projects, web site -www.cea.nic.in
- Hill, P, "Improving Efficiencies of Coal Fired Plants in Developing Countries", Annual Report 2002–2003, © Copyright IEA Coal Research 2003, ISBN 92-9029-378-0, Gemini House, London, 2003, pp. 10-18.
- Singh T.N. and M.L. Gupta, "Clean coal initiatives", C.M.R.I., Dhanbad, India, Scientific Publishers, Jodhpur, 2012, pp. 12
- Wathern, P, "An introductory guide to EIA in: Environmental impacts assessments (2nd ed.), London, U.K, 1988, pp. 3-28

Copyright © 2014 by Academic Publishing House Researcher



Published in the Russian Federation European Researcher Has been issued since 2010. ISSN 2219-8229 E-ISSN 2224-0136 Vol. 81, No. 8-2, pp. 1514-1522, 2014

DOI: 10.13187/er.2014.81.1514

www.erjournal.ru



The Impact of Brand Equity Assets on Consumer Preference for Foreign Brands in Bosnia and Herzegovina

¹Ena Kumbara ²Ali Göksu

1-2 International Burch University, Bosnia and Herzegovina

Abstract

In the free market consumers are faced with a different variation while they making purchase decision. Brand as a term, name, and symbol gives quality and satisfy needs of consumers and on that way assure self recognition. Main objective of this study is to determine the factors which influence consumers to buy international brands rather than national brands.

This study has four independent variables and one dependent variable. Data for this study will be collected using online surveys based on the previous researches about brand equity and its dimensions. Sample for this study were 214 respondents form the territory of Bosnia and Herzegovina. Using descriptive statistics, correlation and multiple regression analyses these data are measured. Results of this research will give benefits to marketing professionals in Bosnian industries where they can try to understand consumers- whether brand equity and its dimensions affect their purchasing decision and does that effect have negative or positive impact. Contribution of this study is reflected in that Bosnian manufacturers and sellers can better meet consumer's wishes and needs, possibilities of potential consumers in this strained economy.

Keywords: Purchase Preference; Brand Equity; Brand Building; Brand Equity Dimensions.

Introduction

Consumers' needs and wishes are very changeable and according to their demand seller needs to be much more intelligent and recognize different effects on consumers purchase preference. Free markets and globalization of trade increased variety of options for consumers when they are purchasing product. In the last period, brands become one of the important factors that influence consumer behavior in the market place. Building brand equity plays one of the main parts in brand building. Previous studies showed that high brand equity will affect consumer preferences and intentions. Brand equity also represent one of the important concept in the business practices giving competitive advantages and help in building strong brands.

For the Bosnian market it is very important to identify factors which influence consumer to buy foreign brands. Bosnian market disposes with a lot of national manufacturer in different industries, but market usually offers foreign products. To help domestic companies, this study will focus on factors influencing Bosnian consumers' foreign brand purchase preference. Aim of this study is to explore brand equity influence on consumers and compare it with Aaker model from 1991. Using four dimensions from this model which include brand loyalty, brand awareness, perceived quality, and brand association hypothesis and model will be created. Using information

from this study, model can be created in accordance to create new way of branding for domestic organizations. Factors explored with this study can discover new ideas how to increase value of domestic products.

The main purpose of this study is to explore attitudes of Bosnian consumers towards foreign brands in purchase decision making process affected by brand equity. For the measuring of Bosnian consumers Aaker brand equity model from 1991 will be used as determinants in this study. Results of this research will give benefits to marketing professionals in Bosnian industries where they can try to understand consumers- whether brand equity and its dimensions affect their purchasing decision.

The first objective of this study is to determine the factors which influence consumers to buy international brands rather than national brands. Second objective of this study is to determine how brand equity and its dimensions (brand loyalty, brand awareness, brand association and perceived quality) effect consumers' foreign brand purchase preference.

Literature review

According to Khan (2007) consumer behavior cannot be defined only as the buying of goods or services that received attention of consumers. He stated that process of consumer behavior started much before products are bought or even seen. He briefly described consumer behavior as the decision-making process and mental activity involved in obtaining, assessing, consuming and ordering of goods and services.

According to Sarangapani (2009) consumer behavior is the study of individuals, groups or organizations and all processes they use to select, confirm, and purchase products, services, practices, or ideas which satisfy their needs. Also consumer behavior is study that finds impacts these processes will have on the consumer and society.

Understanding decision making process will help us to evaluate different stages and behavior of consumer while purchasing product. Since this thesis is about consumer preferences about specific products it is important to explain stages of this process. According to different previous studies here is represented summary of each stage starting with first one; stage of problem recognition.

Different authors such as Brounsard, Belleau, Didier, and Summers, Jin and Koh's, Kamenidou, Mylanokis, and Nikolouli, Ronald and Elizabeth Goldsmith, Leng, Kim and Moon focus on different factors of consumer purchase behavior. The study from 1996 designed by Belleau, Didier, Broussard and Summers made comparison between old and young woman and their attitudes to apparel and media. Results collected shown that younger women give more neutral answers and paid more attention on clothes their friends wore.

Fundamental relationships between brand loyalty variables such as consumer knowledge, product involvement, perceived risk and consumer agreement were examined in Jin and Koh's study (1999) in Korea. Study had shown that information search and consumer agreement influence brand loyalty. For this study in Korea, consumer knowledge, product involvement, perceived risk and consumer agreement were used as variables.

In purchase behavior study, Demir, Yalçın and Erdoğmuş (2009) made research to explain how brand associations create positive brand attitude. Findings showed that significant effects on positive brand attitude have experiential shopping and value for money. Except these two variables, this study also used shopping experience, purchase situation and product as variables.

Study by Kamenidou, Mylanokis, and Nikolouli (2005) focuses on the possible reasons why consumers in Greece purchase imported high fashion apparel more than Greek designer's high fashion apparel. The main goal of this study is to identify the fundamental factors that affect purchasing behavior of consumer in Greece. Results show that imported high fashion apparel products have better aesthetics, a superior line and that those products are produced from quality textiles and materials, compared to the domestic high fashion apparel.

In their purchase behavior studies, Phau and Leng (2007) focus on research which will show does status and non-status seeking Australian teenagers have different attitudes toward buying domestic and foreign (i.e. Italy, Japan, China) luxury brand apparel. Sample for this study were 365 teenagers who completed questionnaire. Fishbein's model was used in comparison attitudes toward buying local and foreign apparel. Results show that status-seeking teenager have more positive attitude toward foreign luxury brand apparel with exception on Chinese brands.

In purchase behavior study, Goldsmith and Goldsmith (2000) tried to separate consumers who have buy clothes ower internet from those who have not. In this studies were 263 male and 303 female students. Students fulfill a survey that measured their buying behavior over internet, buying behavior offline, their attitudes and predispositions. Generally results indicated that 99 online apparel buyers had more online experience and that they did not differ from non-buyers about cheap price presented on Internet. Also they didn't differ in their overall enjoyment of shopping or how cloths are bought.

Consumer principles, requirements and purchase behavior in two Asian markets are examined by Kim, Forsythe, Gu and Moon (2002) in their purchase behavior study. As target country in this study, researchers used China and South Korea. Results showed that self-directed principles of apparel product were one of the major determinants of needs which satisfy consumers. Consumers involved in this study answered that brand loyal behavior will be achieved if all three needs are fulfill.

Kim (2000) in his study presented a different approach on branding matter. This study examines consumer attitudes towards five brand behavior traits for several apparel brands and the relationship between brand behavior and brand preference. Results showed that expectations for apparel brands are different, but brands that have encouraging brand attitude also have encouraging competent rankings. Variables used in this study are anticipation, competence, sincerity, sophistication and sharpness.

Research question/ hypothesis

The main aim of this research is to identify all the influences of brand equity and its dimensions on consumer's foreign brand purchase preference. In other words, the main purpose of this study is to research all the different effects brand equity and its dimensions have on consumer's foreign brand purchase preferences. As explained before Aaker brand equity model and its dimensions such as brand loyalty, brand associations, brand awareness and perceived quality is widely used model for research on similar topics. For this purpose Aaker's brand equity model dimensions are considered. Also, the brand equity dimensions taken into consideration are brand associations, brand loyalty, brand awareness and perceived quality.

The study focuses on the preferences of consumers for foreign brand products from all industries in Bosnia and Herzegovina including nutrition, textile, technology, pharmaceutical etc. Since products from different industries might have different effect on consumer preferences some survey questions are marked and detailed explained on which industry consumer should give attention while answering.

Other objectives are to identify impact of brand equity dimensions on consumers' foreign brand purchase preference as listed below;

- 1. impact of brand loyalty on foreign brand purchase preference
- 2. impact of brand awareness on foreign brand purchase preference
- 3. impact of foreign brand associations on foreign brand purchase preference
- 4. impact of perceived quality on foreign brand purchase preference
- 5. differences between the foreign brand purchase decision of consumers according to selected demographic variables: age, education and occupation.

In this study Aaker brand equity model is used as conceptual framework for research. Main independent variables used by Aaker (1991) and Keller (1993) are brand loyalty, brand awareness, brand associations and perceived quality. Using current examples and previous studies on topics about consumers' preference and purchase intentions this study has four independent variables and one dependent variable.

Independent Variables are:

- Brand Lovalty
- Brand Awareness
- Brand Associations
- Perceived Quality

Dependent Variable is:

• Foreign Brand Purchase Preference

To illustrate the general information of the respondents the demographics in this study is presented as descriptive statistic. Age, education, occupation and gender will be used as comparative determinants to compare effect of brand equity dimensions on consumers. Using previous literature on similar topics this study will used demographics to understand effect of brand awareness and brand associations respectively. Findings of this study might open new horizon of researching consumers' brand purchase preference. Findings can also provide information for industries in Bosnia and Herzegovina. Purpose of this study is to meet consumers' needs and to use important determinations about purchase preference of Bosnian consumers to create model that might be beneficial for domestic manufacturers.

In order to understand the connection between Bosnian consumer's foreign brand preferences and brand equity with its dimensions, the variables below will be tested;

Ho: There is no relationship between brand loyalty/brand awareness/brand associations/perceived quality of Bosnian consumers and their foreign brand apparel purchase decision.

H1: There is significant relationship between brand loyalty and Bosnian consumer's foreign apparel brand purchase preference.

H2: There is significant relationship between brand awareness and Bosnian consumer's foreign apparel brand purchase preference.

H3: There is significant relationship between brand associations and Bosnian consumer's foreign apparel brand purchase preference.

H4: There is significant relationship between perceived quality and Bosnian consumer's foreign apparel brand purchase preference.

Methodology

The applied method of this study is the processing of primary data obtained from survey with an target sample. Since every one of us used or purchased one of the foreign brands target population is too large to consider. Since objective of this study is to increase value of domestic brand equity target population are consumers purchasing or using foreign brands. Purpose of taking sample is to obtain results that will represent majority but in accordance to avoid asking everyone (Fisher, 2007, p.189). After collecting and processing these data, and after results are obtained this study will focus on creating model which will help domestic companies to avoid risk and create high brand equity. On that way, brand equity will have positive impact on consumer preferences and that will help to build strong brand.

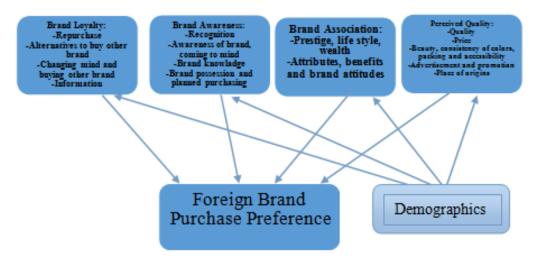


Figure 1 Conceptual Framework of the Study Source: Aaker, D. (1991). Managing Brand Equity: Capitalizing on the Value of a Brand Name.

A research instrument consisted from a series of different questions and other part used for the gathering information from respondents is called a questionnaire. The questionnaire was invented by Sir Francis Galton.

In this study questionnaires are applied among a sample population in Bosnia and Herzegovina. Using Google drive application this questionnaire is conducted online. In the first part of this questionnaire demographics questions such as age, education, occupation are used to gather information about our respondents (using nominal, ordinal and interval scale questions). In the second part of this questionnaire trueness scale is used to gather opinions from respondents about their attitudes. The scale is at the same time a non-forced scale since it covers also a column for no opinion. The strongly agree-strongly disagree scale (see questionnaire) is applied for the 30 questions of the study to detect the respondents" attitude toward foreign brands and their purchase decision.

Questionnaires are prepared in Bosnian for application in Bosnia and Herzegovina. The respondents were asked to answer the questions online, and e-mail was left for extra comments. Necessary modifications were done and finally, the questionnaire was ready to distribute.

Summary of Questionnaire

Aim of question	Number of questions	Type of questions	Statistic Technique
Demographics	I part of questionnaire	Nominal Scale	Frequency
Determining effects of brand loyalty	1-8	Likert Scale	Correlation and Regression
Determining effects of brand awareness	9-14	Likert Scale	Correlation and Regression
Determining effects of brand association	15-22	Likert Scale	Correlation and Regression
Determining effects of perceived quality	23-30	Likert Scale	Correlation and Regression

Results

In the 1880s Francis Galton use idea developed by Karl Person and introduces correlation measures between two variables. The Pearson product-moment correlation coefficient, also called PCC or Pearson's r, usually is used to measure correlation or dependence between two variables. Value r can range between +1 and -1, where 1 present a total positive correlation, and -1 total negative correlation. No correlation between two variables is presented with 0. The Pearson correlation is widely used to measure the degree of dependence between two variables (Galton, 1886).

Since correlation between variable's items is presented, Table 5.16 summarized testing hypothesis and correlation between dependent variable with independent.

Correlation Between Dimensions

Correlations								
		Foreign Brand Purchase Preference	Brand Loyalty	Brand Awareness	Brand Association	Perceived Quality		
Foreign	Pearson Correlation	1	.684**	.634**	.442**	.406**		
Brand Purchase	Sig. (2-tailed)		.000	.000	.000	.000		
Preference	N	214	214	214	214	214		
Brand	Pearson Correlation	.684**	1	.483**	·375 ^{**}	.462**		
Loyalty	Sig. (2-tailed)	.000		.000	.000	.000		
	N	214	214	214	214	214		
Brand	Pearson Correlation	.634**	.483**	1	.569**	.516**		
Awareness	Sig. (2-tailed)	.000	.000		.000	.000		
	N	214	214	214	214	214		
Brand	Pearson Correlation	.442**	·375 ^{**}	.569**	1	·549 ^{**}		
Association	Sig. (2-tailed)	.000	.000	.000		.000		
	N	214	214	214	214	214		
Perceived Quality	Pearson Correlation	.406**	.462**	.516**	·549**	1		
	Sig. (2-tailed)	.000	.000	.000	.000			
	N	214	214	214	214	214		

^{**.} Correlation is significant at the 0.01 level (2-tailed).

As previously defined, correlation value has range from +1 to -1. In the Table 5.16, we can see that there is no negative correlation. The strongest correlation is between brand loyalty and purchase preference (0.684). The lowest correlation is between perceived quality and purchase preference (0.406). Brand awareness has almost equal correlation as brand loyalty (0.634), while brand association has almost equal correlation as perceived quality (0.442). So, it can be concluded that brand loyalty and brand awareness have strong correlation with foreign brand purchase preference, and brand association and perceived quality have low correlation.

In Pearson correlation result can be interpreted as relationship between two variable. If Pearson's r has value close to 1, additional changes in one variable will be strongly correlated with possible changes in the second variable.

Using results we can see that there is positive correlation between each independent variable with dependent. Correlation is significant at 0.01 level and it is 2-tailed. Since for each brand equity dimension significant value is .000 this means that all hypothesis are accepted and that here is significant relationship between brand equity dimensions and foreign brand purchase preference. It can be concluded that brand loyalty and brand awareness have stronger relationship with foreign brand purchase preference, than other two dimensions. Increases or decreases in brand equity dimensions will lead to increases or decreases in foreign brand purchase preference.

According to the results of multiple regression analysis and correlations, the strongest correlation is between brand loyalty and purchase preference (0.684). The lowest correlation is between perceived quality and purchase preference (0.406). Brand awareness has almost equal correlation as brand loyalty (0.634), while brand association has almost equal correlation as perceived quality (0.442). So, it can be concluded that brand loyalty and brand awareness have strong impact on foreign brand purchase preference, and brand association and perceived quality have medium correlation with foreign brand purchase preference. According to this, all hypothesis of this study are accepted.

Conclusion

Bosnian consumers' especially young population is loyal to foreign brand and in this study that has been proved. According to age cross-tabulation, huge differences in answer didn't appear. For the *brand loyalty*, familiarity of the foreign brand and information gathered about foreign brand has almost equal answers according to different age. When we specified question on foreign apparel brand younger generations mostly agreed while generation older than 40 years mostly strongly disagreed. Not even one age group refuse to buy domestic brand in the case that preferred foreign brand is unavailable, but their opinion about buying other foreign brand if preferred foreign brand is unavailable was dived, but in general that differences in opinion were in the same age group. We can say that for the Bosnian consumers, price is important factor when deciding about purchase. They generally strong agreed that when there is discount on other brand that they will buy it, but they also agreed that if their preferred brand has high price, they will still buy it. With this we can conclude that Bosnian consumers stay loyal to foreign brand they prefer, but if there are discounts on other brands they will try with it.

Using descriptive statistics and correlation, relation between *brand awareness* items is measured. Result presented showed that "easily understanding if brand is foreign or not" as part of brand knowledge item present strongest part of the brand awareness for the sample. Brand knowledge is strong item, because other question that focuses on foreign brand from this item, also had high mean. According to correlations, "brand possession and planned purchasing" is the strongest brand awareness item. That means, the sample consider purchasing only products they heard of it. Recognition and brand knowledge also present strong item of brand awareness. Sample considers that they have main knowledge about foreign brand but they will not necessarily try to find foreign brands in the store.

Respondent equally disagree that they will firstly try to find foreign brand than domestic in the store. Each age group, no matter on education or occupation equally gave answer that they disagree or strongly disagree. Respondents on the same way react when they were asked if their behavior to buy foreign brand is usually planned. Also there almost weren't any differences in answer about brand knowledge, recognizing, categorizing foreign brand and understanding if some product is foreign or not. So we can conclude that Bosnian consumers are aware of foreign brands but practice to buy foreign brand is not necessary planned, on this way brand awareness has impact on brand equity and further affect purchase preference.

When we talk about *brand association* results showed that strongest mean have belief that foreign brand have better reputation than domestic brand. Strong mean also have attitude to buy well-known brand of foreign manufacturers. Questions that belong to "attributes, benefits and brand attitudes" have high mean and on that way make that item strong. On the other hand, belief that opinion of other people depend on foreign and expensive brand has very low mean and present weak item of brand association. Using multiple comparison analyses to measure relation between demographics and brand association primary school and PhD degree have significance level less than 0.05 and they showed meaningful difference. Age and occupation didn't showed meaningful differences and theirs significance level was higher than 0.05.

Respondents generally agreed that advertisement and reputation of foreign brand is better than domestic, that foreign brands provide more benefits but that wasn't reason to make purchase decision for foreign brand. These facts are confirmed by ANOVA tests, which showed that significance level of this equity dimension is more than 0.05.

Perceived quality coverage next items: quality, price, and beauty, consistency of colors, packing and accessibility, advertisement and promotion, and place of origins. Using descriptive statistics, results obtained showed that "beauty, consistency of colors, packing and accessibility of foreign brands" has highest mean and represent strong item of perceived quality. Other questions from survey have almost equal mean with one exception. "Buying domestic brand if has same quality as foreign brand" according to sample has very low mean. According to demographics opinion about quality of foreign brand regardless to domestic brand was divided. Even analysis

showed that there wasn't any significant differences in terms of brand equity dimensions, with further research and re-controlling of answers some differences might be seen.

To conclude this study, we can say that Bosnian consumers affected by economic crises have really divided opinion about foreign and domestic brands. Also we can conclude that brand loyalty and brand awareness have positive effect on consumer purchase preference and brand association effect consumer preferences negatively. Deeply research in perceived quality give us picture that quality has divided effect on consumer purchase preference in accordance to age, occupation and education. Respondents are not necessarily associated with foreign brands and they respect domestic brands, but when they are making purchase decision price and already well-known products have priority. This study and results presented can help Bosnian manufacturers and sellers to meet consumer's wishes and needs. Advertisement, promotion, discount, customary quality and small variations in products internal and external structure can lead to create strong brand. Even if brand become strong, it is important to keep that status, offer consumers better quality and work on wishes and needs of consumers. In this strained economy where small salaries are usual manufacturer should meet possibilities of potential consumers and offer legitimate reasons to stay loyal and purchase specific brand.

References:

Aaker, D. (1991). Managing Brand Equity: Capitalizing on the Value of a Brand Name.

Aaker, D. A. (1989). Managing assets and skills: the key to a sustainable competitive advantage.

Aggarwal, P. (2004). The Effects of Brand Relationship Norms on Consumer Attitudes and Behavior. *Journal of Consumer Research*. doi:10.1086/383426

Ahmed, S. A. (1995). Comparison of country of origin effects on household and organizational buyers' product perceptions. *European Journal of Marketing*.

Belch, M. A. (1982). A segmentation strategy for the 1980's: Profiling the socially-concerned market through life-style analysis. *Journal of The Academy of Marketing Science*. doi:10.1007/BF02729340

Bruner, J. S., & Bruner, J. (1990). Acts of Meaning / J.Bruner. Cambridge, EUA: Harvard University.

Lassar, W., Mittal, B., & Sharma, A. (1995). Measuring customer-based brand equity. *Journal of Consumer Marketing*. doi:10.1108/07363769510095270

Lee, K., & Mahajan, S. (1990). Corrective and Reinforcement Learning for Speaker-Independent Continuous Speech Recognition. *Computer Speech & Language*.

Mummalaneni, V., Dubas, K. M., & Chao, C. (1996). Chinese purchasing managers' preferences and trade-offs in supplier selection and performance evaluation. *Industrial Marketing Management*.

Parsons, J., Gallagher, K., & Foster, K. D. (2000). Messages in the Medium: An Experimental Investigation of Web Advertising Effectiveness and Attitudes toward Web Content.

Piron, F. (2000). Consumers' perceptions of the country-of-origin effect on purchasing intentions of (in)conspicuous products. *Journal of Consumer Marketing*. doi:10.1108/07363760010335330

Sullivan, L. (1990). Body image: Differences between high and low Self-Monitoring males and females. *Journal of Research in Personality*. doi:10.1016/0092-6566(90)90022-X

Symposium on Interpersonal Theory in Psychiatry and Social Science, M., & William Alanson White Association, N. (1952). The contributions of Harry Stack Sullivan: A Symposium on Interpersonal Theory in Psychiatry and Social Science. New York: Hermitage House.

Wang, H., Wei, Y., & Yu, C. (2008). Global brand equity model: combining customer-based with product-market outcome approaches. *Journal of Product & Brand Management*.

Wood, M. (1998). Socioeconomic status, delay of gratification, and impulse buying. *Journal of Economic Psychology*. doi:10.1016/S0167-4870(98)00009-9

Copyright © 2014 by Academic Publishing House Researcher



Published in the Russian Federation European Researcher Has been issued since 2010. ISSN 2219-8229 E-ISSN 2224-0136 Vol. 81, No. 8-2, pp. 1523-1531, 2014

DOI: 10.13187/er.2014.81.1523

www.erjournal.ru



Consumer Attitude Toward Mobile Marketing in Bosnia and Herzegovina

¹ Irma Jasarspahic ² Teoman Duman

1-2 International Burch University, Bosnia and Herzegovina

¹ E-mail: irmica-j@hotmail.com

² E-mail: teoman.duman@ibu.edu.ba

Abstract

Driven by the ongoing evolution in mobile technologies and the increasing popularity of the internet, the mobile marketing is becoming more and more popular to marketers whose aim is definitely to promote their goods and services to the consumer. Since many people are still unaware of the potential of marketing via mobile devices this research aimed to examine factors based on content of mobile marketing (entertainment, information, irritation, utility and personalization) and frequency factor that are affecting the formation of attitude toward mobile marketing targeting BH consumers, and also will try bring to light the response behavior of consumers attitude toward mobile marketing practices and how consumers perceive mobile marketing in BH.

The research approach for this study is descriptive and the data was collected by 200 online surveys from young population of BH. The data was analyzed using the software program SPSS. Based on analysis and findings, variables of content have different effect on consumer attitude. Research has shown that a lot of respondents believe mobile marketing is a good idea and that they certainly eases the need for products and services. This paper could be used as a good basis for future research on bigger sample.

Keywords: Mobile marketing; Consumer Attitude; Response Behavior; Survey; SPSS.

Introduction

Considering the huge increase in the popularity of mobile technology and the internet, *mobile phones* and tablets will be more important advertising screens than the traditional *TV*. New mobile technology has a very important impact on today's businesses. Just the fact that the mobile phone is always with its owner is very important from the perspective of advertisers and brands that surround us. Due to this fact marketing experts invented the term "mobile marketing".

Common definition states that *Mobile marketing* is simply the process of marketing to people via their mobile devices. Using their mobile phones people are often faced with different forms of mobile marketing: SMS and MMS marketing campaigns (promotional bulk), SMS prize games, SMS quizzes, print or packaging of products that have QR code, examples of branded mobile applications that are developed for the needs of local promotions, mobile banking, huge number of popular mobile applications, etc. Mobile marketing is becoming interesting to the

companies that have started to use SMS marketing to promote their products and services. Thus, personal nature of the mobile phones accelerated the usage rate of SMS and MMS as a marketing channel (Taylor, 2008).

According to the data of Agency for Statistics of BH, number of mobile phone users in BH is increasing every year, and some households have five and more mobile phones (bhas, 2014). Although mobile marketing has enormous potential and it is one of the fastest growing new advertising tactics, there is still lot to learn about it in BH context. The purpose of this study is to examine factors that are affecting the formation of attitude toward mobile marketing targeting BH consumers.

Literature review

In order to support this research it is important to deliver relevant literature of earlier studies about mobile marketing and attitudes towards it.

Roach (2009) tried to examine how a consumer's perception of the relative advantages, compatibility and complexity associated with mobile phone marketing, and their involvement with their mobile phone, influenced their intention to accept mobile marketing. She used a deductive, quantitative research approach for her study, and the data was collected using questionnaire administered to a sample of 254 university students. Findings showed that a consumer's perceptions of two of the three innovation attributes tested (relative advantage and compatibility) were significantly associated with their acceptance (or adoption) of marketing messages sent via their mobile phone.

Parreño (2013) analyzed key drivers of teenagers' attitude toward mobile advertising and its effects on teenagers' mobile advertising acceptance. As an approach to his research he used proposed model of affective (irritation and entertainment) and cognitive (perceived usefulness) factors that influence on the attitude toward mobile advertising and its acceptance. Findings showed that entertainment, irritation and usefulness are key drivers of teenagers' attitude toward mobile advertising. Moreover, perceived usefulness reduces irritation.

Gao (2010) examined factors affecting consumers' acceptance of mobile marketing in China. As a research method authors used technology acceptance, uses and gratifications theories to develop a conceptual model of antecedent factors (including risk acceptance related to the mobile platform and personal attachment related to mobile devices); marketing-related mobile activity; and acceptance of mobile marketing practice. The results showed that the importance of risk acceptance and personal attachment led to greater mobile marketing acceptance, and support the "priming" effect of regular mobile phone usage on orienting consumers toward accepting mobile marketing initiatives.

Smutkupt (2012) investigated the impact of SMS (Short Message Service) advertising on consumer perceptions of Au Bon Pain's brand equity in Thailand. As methodology they developed a 4x2 between-subjects method, with four levels of message types (personalization, interactivity, general, and no message control) and two levels of permission (with and without permission). Then three message types (i.e. personalized, interactive, and general ads) were send to the participants, who were first split into two groups on the basis of their willingness to receive messages from the tested brand: permission group and non-permission group. The results indicated that SMS marketing has a significant positive impact on brand awareness and perceived quality.

Persuad and Azhar (2012) in their study investigated consumers' willingness to accept marketing through their smartphones. They collected data by self-administered web-based surveys of 428 respondents from Canada. The survey contained questions about respondents' mobile phone usage behavior and their perceptions of, and intention to, participate in mobile marketing. The results indicated that consumers' shopping style, brand trust, and value are key motivations for engaging in mobile marketing through their smartphones.

Jayawardhena (2009) aimed to develop a conceptual model to examine the influence of four antecedent factors (personal trust, institutional trust, perceived control and experience) on consumers' willingness to participate in permission-based mobile marketing. Data is collected from surveys of consumers in Finland, Germany and the UK. He found out that the main factor affecting the consumers' decision to participate in mobile marketing is institutional trust, while the influence of other antecedent factors are less pronounced. Altogether, it is found that the more experienced

consumers become with mobile marketing, the less influence perceived control will have on permission.

Research questions/ hypothesis

The purpose of this study is to determine the attitudes of young population toward Mobile Marketing in Bosnia and Herzegovina and to discover the relationships of customer attitudes with their response behavior. Variables are created from previous theories and models, and combined in order to research main problem of the study. Therefore; **hypotheses** are formulated to analyze further if consumer form a positive or negative attitude when content is considered:

- **H1: Entertainment** is positively correlated with overall attitude towards Mobile marketing practices.
- **H2: Information** is positively correlated with overall attitude towards Mobile marketing practices
- **H3: Irritation** is negatively correlated with overall attitude towards Mobile marketing practices
 - **H4:** Utility is positively correlated with overall attitude towards Mobile marketing practices
- **H5: Personalization** is is positively correlated with overall attitude towards Mobile marketing practices
- **H6:** Frequency of receiving mobile ad is negatively correlated with overall attitude towards Mobile marketing practices

The following research questions are determined:

- **R.Q.1:** What are the main personal factors that affect consumers attitude toward Mobile Marketing?
- **R.Q.2:** What is the overall attitude toward mobile marketing among respondents in Bosnia and Herzegovina (positive or negative)?

Since this study will try to bring to light the response behavior of consumers attitude toward mobile marketing practices in BH, the next research question is formulized:

R.Q.3: How the consumers' attitude toward mobile marketing correlate with the consumers' response behavior (e.g., purchase intentions) of Mobile Marketing?

Research methodology

The survey was collected through Google docs, afterwards the data was exported to Microsoft Excel. Total sum of 200 surveys was completed on April 30th. The data was checked for completeness and 23 respondents were deleted from table because of the unfamiliarity with Mobile Marketing. Respondent were ask to answer the questions based on their experience with Mobile Marketing by evaluating statements using the Likert Scale from 1-5 where 1 represents (strongly disagree) and 5 represents (strongly agree) while 3 represent (neutral) for those who didn't have any opinion about this.

Based on the completed surveys, researcher identified customer attitudes for mobile advertising, and the results of the survey dealt in the software program SPSS (Statistical Package for the Social Sciences), which has helped me to establish and carry out an analysis of customers attitudes, and to set priorities thereof. The frequency analyses of demographic questions in the questionnaire were examined. The attitude questions in the questionnaire were examined with descriptive analyses, reliability and regression analyses.

Conceptual framework

The research is focusing on different factors that affecting consumer attitude toward mobile marketing. Basic purpose of this research is to understand the effect of each factor on consumer attitude toward mobile marketing, whether positive or negative. The following figure 1 presents accepted and applied model.

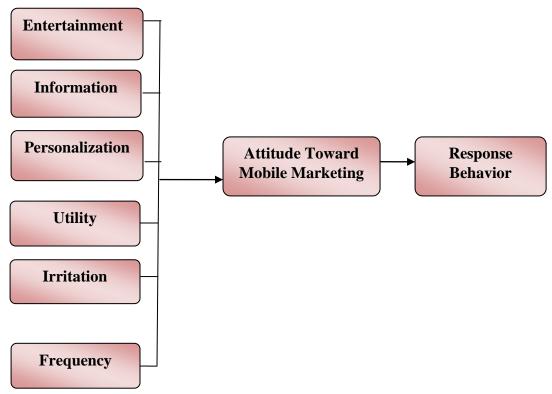


Figure 1: The Model

The value of **entertainment** lies within the ability to fulfill the consumers' needs for escapism, diversion, aesthetic enjoyment or emotional release. According to Haghirian (2005), the perceived entertainment of mobile advertising is not only related to attitude, but also adds perceived value of the advertisement by customer.

Advertisement **informativity** has been defined by Mackenzie (1989) as "the extent to which the consumer perceives claims made about the brand in the advertisement to be truthful and believable". Ad informativity is defined as the extent to which the consumer perceives claims made about the brand in the ad to be truthful and believable, and perceive the source to have knowledge and skills, and to give truthful and unbiased information.

A variable that has not been subjected to a lot of empirical research is **personalization**, where messages are catered to fit the individual and offer individualized content. Without personalization, mobile advertising is nothing more than impersonalized mass messaging, that may be neither informative nor entertaining to the receiver and can result in a negative attitude towards the advertisement (Bauer, Reichardt, Barnes and Neumann, 2005).

The **utility** concept is a basic constituent of relationship marketing, the ability to provide superior value to customers is a prerequisite when trying to establish and maintain long-term customer relationships. A value can be described as an enduring belief that a specific conduct or state is personally-psychologically or socially-culturally preferable to a converse mode of conduct or an opposite end state of existence (Levi, 1990).

Irritation in advertising can be defined as an advertisement that generates annoyance, discontent, and brief intolerance. Tsang assert that perceived irritation of mobile advertising has impact on consumers' attitude toward mobile advertising. When advertising is intrusive, it will result in irritation, which in turn will have a negative effect upon the attitude and influence on the consumer's behavior. Irritation can also cause that the persuasive power of the ad is reduced.

There are arguments about personalization and **frequency** of receiving mobile ads. Robins (2003) argued that consumers would like the content of mobile services to be customized to their interests and relevant for them. Personalization of mobile marketing can enable marketers to reach their potential customers in a very individual way and thus increase the relationship with the

consumers. However other research argued that Frequency of exposure to the mobile marketing affect customers attitude towards this type of advertisement (Ducoffe, 1995).

Results

One of the today's most popular reliability statistics in use is Cronbach's alpha (Cronbach, 1951). It determines the internal consistency or average correlation of items in a survey instrument to measure its reliability. Alpha coefficient ranges in value 0-1 and it can be used to describe the reliability of factors extracted from questionnaires or scales. Nunnaly (1978) has indicated 0.7 to be an acceptable reliability coefficient but lower thresholds are sometimes used in the literature.

Cronbach Alpha is higher than 0.7 for all tested items, so it means that this scale can be evaluated as reliable. The following step is to determine correlation values among independent variables in the research model. **Correlation analysis** is used to test the degree of association between variables. The arithmetic means, standard deviation and correlation values of the factors are presented in Table 1.

Factors	AA	SS	1	2	3	4	5	6	7
Frequency	3.06	0.89	1	- .321	448	270	523	381	296
Entertainment	3.85	1.04		1	.583	.019	.530	.395	.540
Information	3.49	1.09			1	054	.496	.398	·575
Irritation	4.25	0.98				1	011	.032	054
Utility	3.66	1.10					1	.400	.531
Personalization	3.67	1.01						1	.374
General Attitude	3.40	1.11							1

Table 1: Correlation Analyses

Multiple regression is an extension of simple linear regression. It is used when we want to predict the value of a variable based on the value of two or more other variables. As shown in research model, independent variables are entertainment, information, irritation, utility, personalization and frequency of receiving ads. So, in the first stage of multiple regression analyses, the relationships between variables were examined including dependent variables and independent variables. In this stage, researcher tested hypothesis.

In statistics, standardized coefficients or beta coefficients are the estimates resulting from an analysis performed on variables that have been standardized so that they have variances of 1. This is usually done to answer the question of which of the independent variables have a greater effect on the dependent variable in a multiple regression analysis, when the variables are measured in different units of measurement. The p-values in the following tables will show the significance level of the variables. Variance inflation factor (VIF) show whether the high correlation in the relationship between variables causes a problem or not.

Model	Unstandardized Coefficients		Standardize d Coefficients	t	Sig.	VIF
	В	Std.Error	Beta			
(Constant)	.618	.183		3.373		
Entertainment	.228	.052	·335	4.377	.000	1.599

Table 2: Multiple Regression Analysis Related to Entertainment toward Attitude

As it can be seen from the table above, both variables significantly influence the general attitude toward mobile marketing in 0.05 significance level. There is a strong relationship (p=.000) between dependent variable and **Entertainment**. The second independent variable that has been used to predict the value of our dependent variable is **Information**. The corresponding hypothesis is Information is positively correlated with overall attitude towards Mobile marketing.

Table 3: Multiple Regression Analysis Related to Information toward Attitude

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	VIF
	В	Std.Error	Beta			
(Constant)	.770	.153		5.031	.000	
Information	.230	.049	.352	4.681	.000	1.678

The following table presents data related to **Irritation**. It is important to point out that two statements that were measuring this factor had negative connotation, so in this case we will have reverse situation (high numbers present negative and low numbers present positive attitudes).

Table 4: Multiple Regression Analysis Related to Irritation toward Attitude

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	VIF
	В	Std.Error	Beta			
(Constant)	.690	.173		4.272	.000	
Irritation	.218	.046	.340	5.125	.000	1.575

It is important to point out the t value in the table. There is a very strong relationship (t=5.125) what gives a red signal to companies and marketers. It is very logical that irritation may influence the consumer behavior in negative way.

Table 5: Multiple Regression Analysis Related to Utility toward Attitude

Model		ndardized ficients	Standardized Coefficients	t	Sig.	VIF
	В	Std.Error	Beta			
(Constant)	.498	.176		2.825	.005	
Utility	.242	.043	.363	5.531	.000	1.271

This table represents two items related to **Utility**. There is no doubt about meaningful relationship between these two variables determing general attitude (p=.000, t=5.531). These results can be also be related to population group which was tested, knowing that young population is very familiar with mobile tools and forms.

The following table presents data obtained by analyzing items related to **Personalization** and their impact on the general attitude of consumers of mobile marketing.

Table 6: Multiple Regression Analysis Related to Personalization toward Attitude

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	VIF
	B Std.Error		Beta			
(Constant)	.721	.230		3.135	.002	
Personalization	.230	.047	.326	4.903	.000	1.023

From the table it can be concluded that users really expect personalized content, and that their attitude will be more positive if the content is more adapted to the user. Table 7 shows how **frequency of receiving mobile ads** influence general attitude.

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	VIF
	B Std.Error		Beta			
(Constant)	3.102	.184		16.855	.000	
Frequency of receiving	236	.058	296	-4.095	.000	1.000
mob ads						

Since in this case we have a negative value of B and Beta, we can immediately conclude that there is a negative relationship between the variables. This factor can be associated with irritation, because too many ads from one consumer may cause a negative attitude about the same. Companies should be very careful about this factor. The final table in this section presents Multiple Regression Analysis related to General Attitudes toward **Response Behavior**. In this case, General Attitude is independent variable, while Response Behavior is dependent variable.

Table 8: Multiple Regression Analysis Related to Attitudes toward Response Behavior

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	VIF
	B Std.Error		Beta			
(Constant)	1.953	.271		7.276	.000	
Attitude	.584	.109	.373	5.332	.000	1.000

Conclusion

Based on analysis and findings, variables of content have different effect on consumer attitude. According to the result of multiple regression analysis we may also know that when consumers express their attitude toward mobile marketing, they evaluate the information and entertainment that they perceived from the advertising material and then define their attitudes accordingly. In view of the above factors, to improve consumer's mobile marketing attitude the mobile marketing managers should never forget the following proposals when implementing mobile marketing. Firstly, the mobile marketing managers of companies should respect consumers completely through getting permission of sending mobile advertisement to consumers and to compete with other companies of the same industry, incentive is the most effective instrument. At the same time, the company should implement different advertising strategies for high and low involvement consumer groups to increase the involvement of all consumers. Besides, different forms of advertisement provide product information in different degrees. On the other hand, if a consumer shops using mobile marketing, company should provide the convenient, benefit or discount promised in the mobile advertisement to give the consumer a satisfactory experience. All the above mentioned categories are for the improvement of consumer's perceived advertising value and attitude toward mobile marketing.

Limitations and Future Research

Even if young population is faster adopter of new technology than adults the main restriction of this research has been pointed that young population is not homogeneous audiences for mobile

phones because of social background, gender, urban/rural lifestyles, and technological literacy can widely vary. Future researches relevant to the mobile marketing topics should address this issue along with the moderating role of gender because gender-related aspects can affect attitudes toward mobile marketing (Karjaluotoet, 2008). Future research can also be expanded by factors like intrusiveness and perceived control which are similar to irritation; additionally it could analyze the role of such factors on consumer attitudes and behavior towards mobile advertising on bigger sample and with more items per factor in survey. A recommendation is also to conduct empirical research with a important focus on demographics, using a representative sample of the population of multiple countries to map the differences.

References:

Agencija za statistiku BiH, (2014). Retreived March 2014 from http://www.bhas.ba

Bauer, H.H., Reichardt, T., Barnes, S.J., & Neumann, M.M.. (2005). Driving consumer acceptance of mobile marketing: a theoretical framework and empirical study. *Journal of Electronic Commerce Research*, 6(3), pp. 181-191.

Cronbach, L.J. (1951). Coefficient alpha and the internal structure of tests. Psychometrika, Vol. 16, pp. 297-334.

Ducoffe, R.H. (1996). Advertising value and advertising on the web. *Journal of Advertising Research*, Vol. 36 No. 5, pp. 21-35.

Gao, T. T., Sultan, F., & Rohm, A. J. (2010). Factors influencing Chinese youth consumers' acceptance of mobile marketing. *Journal of Consumer Marketing*, 27(7), 574–583.

Haghirian P., Madlberger M., Tanuskova A., (2005). Increasing Advertising Value of Mobile Marketing –An Empirical Study of Antecedents, 38th Hawaii International Conference on System Sciences, p. 32

Jayawardhena, C., Kuckertz, A., Karjaluoto, H., & Kautonen, T. (2009). Antecedents to permission based mobile marketing: an initial examination. *European Journal of Marketing*, 43(3/4), pp. 473-499.

Karjaluoto, H., Lehto, H., Leppa "niemi, M. and Jayawardhena, C. (2008). Exploring gender influence on customer's intention to engage permission-based mobile marketing, Electronic Markets, Vol. 18 No. 3, pp. 242-259

Levi, S. (1990). Values and Deeds. Applied Psychology: An Interactional Review, 39 (4), pp. 379-400.

MacKenzie, Scott B. (1989). The Role of Attitude Toward the Ad as a Mediator of Advertising Effectiveness: A Test of Competing Explanations. *Journal of Marketing Research*, Vol. XXIII, 130-43.

Nunnaly, J.C (1978). Psyhometric Theory (2.Ed), New York: McGraw-Hill.

Parreño, J. M. (2013). Key factors of teenagers' mobile advertising acceptance. Industrial Management & Data Systems, 113(5), 732–749. doi:10.1108/02635571311324179

Persaud, A., & Azhar, I. (2012). Innovative mobile marketing via smartphones: Are consumers ready? Marketing Intelligence & Planning, 30(4), 418–443. doi:10.1108/02634501211231883

Roach, G. (2009). Consumer perceptions of mobile phone marketing: a direct marketing innovation, *Direct Marketing: An international Journal*, Vol. 3, Iss: 2, pp. 124-138

Robins, F. (2003). The Marketing of 3 G: Marketing Intelligence & Planning, pp. 370-378.

Smutkupt, P., Krairit, D., & Khang, D. B. (2012). Mobile marketing and consumer perceptions of brand equity. *Asia Pacific Journal of Marketing and Logistics*, 24(4), 539-560. doi:10.1108/13555851211259016

Taylor Charles R., Okazaki S. (2008). What is SMS advertising and why do multinationals adopt it? Answers from an empirical study in European markets, *Journal of Business Research*, Vol. 61, pp. 4-16

Copyright © 2014 by Academic Publishing House Researcher



Published in the Russian Federation European Researcher Has been issued since 2010. ISSN 2219-8229 E-ISSN 2224-0136 Vol. 81, No. 8-2, pp. 1532-1545, 2014

DOI: 10.13187/er.2014.81.1532

www.erjournal.ru



Current State of Production and Finance Development of Scientific and Technological Progress in Agriculture

Danil M. Matveev

Novosibirsk state agrarian university, Russian Federation 630039, Novosibirsk, Dobrolyubova st., 160 PhD (Economy), Associate Professor E-mail: danil-matveev@list.ru

Abstract

Poor efficiency in the use of land, labor, finance and other resources available is characteristic of Russia's agriculture at the present stage. In most subindustries, the country has not yet achieved the production volume of the early 90s. In the last decade there was a positive trend marked to update logistics and intensify innovative advance in the agriculture, the processes being actively supported by the state, but this did not result in appreciable improvements of the agriculture competitiveness in the global food market. During the study it is revealed that the industry credit debt has gone up three-fold over the past 7 years that made up 1.43trillion rubles versus 112 billion rubles of revenue in 2012. The authors propose a technique to attract private investments in the agriculture of Russia and economic-organizing mechanism to realize it. Hereto, a considerable part is played by state regulation, particularly to provide investment-back guarantees in the event that a project-implementing agricultural organization goes bankrupt. To hold up, the authors consider a number of investment projects implemented by one of the Russian Federation entities which demonstrate their effectiveness both for the investors and the state. Employing the data obtained from the study will allow to largely increase the rates of technical and technological re-equipment of the industry, improve its investment attractiveness and competitiveness based on innovations and this will provide the country's food safety and gross domestic product growth.

Keywords: agriculture; scientific and technological advance; projects funding; state regulation; investment attractiveness.

Introduction

At the present time, Russia's economy is characterized by low rates of development. This is mainly caused by the technical and technological backwardness of its major industries, except for those aimed to extract and realize natural resources. Russia's agriculture is virtually noncompetitive in the world market because of appreciable technological lagging of the industry, poor supply of the main types of modern farm machinery and lack of qualified personnel. Herewith, the volume of output in the industry was 3.34 trillion rubles in 2012. Over the past 5 years, the level of agricultural production profitability rose to 9.4%, yearly inflation rate being 7.6% averaged over the same period. All these combined with insufficiently growing state support make the transition to a new technological setup virtually impossible [1].

Russia's joining the World Trade Organization (WTO) and the reduction of restrictive customs barriers for main food importers largely undermines the competitiveness of Russian farm commodity producers. The commitments undertaken envisage not only market opening, but also the declining scope of state support for the industry from \$ 9 billion to \$ 4.4 billion by the year 2018. In our opinion, the transition of big agricultural organizations to the new technological level will allow to create points of increase in the industry and more rapidly promote scientific and technological achievements and good practice to production. To do this, it is reasonable to develop the mechanism to attract big private investors and its realization shall ensure the industry development on the innovation basis [2].

Materials and Methods

The analysis carried out in the current state of agriculture rests on the data presented by Russian Federal State Statistics Service for the period 2005 - 2012. To do this job, annual reports of the biggest farm commodity producers of Novosibirsk region (Novosibirskaya oblast) were readily used. During the study the authors applied standard methods of statistic analysis, such as descriptive statistics, comparison, analysis and synthesis, pictorial representation, etc.

To study the efficiency of investment projects implemented and the state support operating for the industry the data of the Novosibirsk region Ministry of Agriculture were used, so were the business-plans of commercial organizations.

Discussion

Nowadays, the efficient production cannot be ensured without applying the latest technologies. The demand for innovative products grows with each year coming. The latest alternative (resource-saving) technologies applied and innovative techniques introduced into farm economy management largely determine the organization's competitiveness under modern market conditions. In spite of the growing state support, Russian agriculture lags behind the European in many respects. Under the WTO conditions, Russia's farm commodity producers will be unable to compete with foreign suppliers. The way out of the situation can be the industry's transition to the new technological setup focused on the introduction of new technologies and equipment.

The major factors restricting the advance of Russia's agriculture and its technical and technological re-equipment at the present stage are:

The first factor is **social-psychological**. In this case, a question of importance is qualified personnel – scarce for today – who are ready to master innovative technologies and equipment. At the present time, there is a negative trend observed in the agriculture, viz. the rural young people's outflow to big cities and reduced number of working-age population [3].

Index	2007	2008	2009	2010	2011	2012	2013	2012 vs. 2005, %
Population, mln.pers.	142.0	142.7	142.8	142.8	142.9	142.9	143.0	101
residing in village	38.1	37.9	37.8	37.6	37.5	37.3	37.2	97.6
Working-age population, mln.pers.	90.1	89.8	89.3	88.0	87.9	87.1	86.1	95.6
residing in village	23.0	22.9	22.8	22.2	22.1	21.8	21.4	94.6
rural population,%	26.6	26.5	26.4	26.3	26.2	24.1	26.0	-

Table 1: Dynamics of the population size in village and city

The population residing in rural territories goes down with each year coming and in 2013 it constituted 37.2 mln. people. It is observed that since the year 2007 the size of working-age population has been declining as well. The range of the decline was from 90.1 in 2007 to 86.1 mln. people in 2013. The deficiency of qualified personnel made agricultural organizations to be headed and governed by specialists without higher education who had not been trained to operate on the innovation basis (table 1.)

^{*} According to Russian Federal State Statistics Service. Available at www.gks.ru (accessed March 2014) [4].

2012 vs. 2009 Index 2005 2006 2007 2008 2010 2011 2012 2005, % 2.9 times Gross domestic product, trillion rub. 21.61 26.92 33.25 41.28 38.81 46.31 55.80 62.6 as much 2.4 times 1.38 1.57 1.93 2.46 2.52 2.59 3.26 3.34 incl.: farm output as much 6.4 5.8 5.8 6.0 6.5 5.6 5.8 5.3 Agriculture's share in Russia's GDP, % Population employed in all the branches 69.2 70.8 70.9 68.3 71 69.4 69.9 71.6 104.8 of national economy, mln. pers. Agriculture-employed population, mln. 6.9 5.2 6.9 6.3 6.0 5.8 5.4 5.5 75.4 pers. Average monthly labor payment for the 3.9 times 3.65 4.57 6.14 8.48 9.62 10.67 12.46 14.13 agriculture-employed, tsd. rub as much Labor productivity averaged over 316.4 389.0 469.6 581.4 559.2 662.5 787.0 874.3 2.8 national economy, tsd.rub./pers. Labor productivity in agriculture, 200.1 227.6 306.6 410.2 433.8 479.2 593.0 642.4 3.2 tsd.ru./pers.

Table 2: Labor productivity in agriculture

To date, the agriculture employs 5.2 mln. people, the type of the activity concerned is the least paid in the whole country. Monthly labor payment averaged over the year 2012 was 14.13 tsd. rubles, the share of agriculture in the country's GDP being 5.3% without processing enterprises included and the rates of productivity growth exceeding mean values for the economy (table 2).

The second factor exerting a negative influence upon the innovation advance of Russia's agriculture is *information-methodical*. The out-of-date mechanism of information dissemination and the absence of unified information-technology system of scientific support cause the information to disseminate irregularly therefore farm commodity producers are often unaware of benefits and programs they can employ. This also holds true for mastering the achievements of scientific and technological progress, employing the innovative techniques of agricultural economy management and introducing good practice of developed countries [5].

To develop and increase the number of information extension centers that shall take on the functions to solve management and production problems can be an effective resolution of the factor. Centers of the type will assist in efficient using the state support funds and investment stock, optimizing machine and tractor fleet under the conditions of transition to the latest production technologies of agricultural output [1].

The system of information extension activity in agriculture performs four functions:

- 1. Information. Represents the structure of public access and is of reference database character.
- 2. Advisory. Includes the structures of advisory service for Agroindustrial Complex (AIC) entities. The final outcome of the activity is to develop recommendations for the client's problem resolution.
- 3. Training. Enhances economic and managerial competence of top-managers of enterprises via workshops conducted not only by advisors, but also by leading agricultural scientists.
- 4. Innovation. Information extension centers are to serve as a link between research institutions, agrarian universities and farm commodity producers. It is worth noting that this is the most challenging and important function as the ways of farming in Russia are very different because of the vast territories, which makes it impossible to apply the same developments in different parts of Russia.

In 2012, the advisory service of Russia's agriculture employed 3017 advisors, of them, 1100 people worked (36%) in regional organizations, 1917 (64%) did in district (rayon) extension centers

Throughout the entire period examined there has been an appreciable growth in government allocations to support the information extension centers, from 217.8 mln.rub. in 2007 to 508.9 mln.rub. in 2012 (table 3).

^{*} According to Russian Federal State Statistics Service. Available at www.gks.ru (accessed March 2014) [4].

Table 3: Dynamics of financial support for the activities of organizations engaged in agricultural advisory service, mln. rub.

Funding sources	2007	2008	2009	2010	2011
Federal budget	34.8	157.6	309.2	11.9	0
RF entities budget	104.9	153.1	181.6	264.4	274.4
Municipal formations budgets	25.5	32.9	59.8	107.4	131.8
Off-budget sources	52.6	106.9	105.8	116.2	102.7
Total	217.8	450.5	656.4	499.9	508.9

^{*} According to Russian Federal State Statistics Service. Available at www.gks.ru (accessed March 2014) [4].

The third factor that restrains the advance of agriculture is **economic-organizing**. The point is that the obsolete mechanism of innovative products mastering and low solvency of these products' consumers cause the novelties to take quite a long time to be put into operation. Besides, agricultural producers do not have enough equity to afford the latest technology and as a result, have to take on credit. It is improved investment attractiveness of the industry that can solve the problem. At the present time, big investors do not feel like investing money in agriculture because of high risk and low profit [6].

Three directions to enhance investment amounts can be defined:

- 1. Human capital investments. In the view of the aforesaid, agriculture experiences the lack of professional staff therefore it is urgent to arrange and conduct their comprehensive training and on-the-job training. All these require big funding, but the outcome will be high, appropriate to the funding.
- 2. Investments in biological resources development. The efficiency of agricultural production directly relates to the quality of biological stock. For example, yielding capacity depends on biological properties and quality of seeds and soil fertility, livestock productivity does on feed quality and properties.
- 3. Investments in development and introduction of energy- and resource-saving technologies will, in a relatively short time, allow to increase labor productivity, utilization of nature and landscape resources as well as labor and financial ones.

A positive trend to solve the problem of improving the efficiency and competitiveness of home farm commodity producers in the world market has been observed since the year 2006 when the implementation of the Federal Law «About the advance of agriculture and agrifood market in Russian Federation» began. In 2008, the state program of agricultural development and regulation of farm produce, raw stock and food markets for 2008-2012 joined into force. In the frameworks of the program, state funding for the agriculture appreciably went up both on federal and regional levels. This made it possible to bring agriculture degradation to a stop in most entities of Russian Federation. Regarding the branches, such as pig-breeding and poultry-farming, there was a positive trend observed in the volumes of production and its efficiency (table 4) [7].

Table 4: Efficiency of state support for agriculture

Index	2005	2006	2007	2008.	2009	2010	2011	2012
Total consolidated budget expenditures for agriculture and fishery, bln.rub.	78.6	110.8	146.4	238.3	279.1	262.3	268.7	276.5
Crop area, mln.ha	75.84	75.28	74.76	76.92	77.81	75.19	76.66	76.33
incl.: grain and leguminous crops	43.59	43.18	44.27	46.74	47.55	43.19	43.57	44.44
Livestock population, mln. units: - cattle	21.63	21.56	21.55	21.04	20.67	19.97	20.13	19.98
of them: cows	9.52	9.36	9.32	9.13	9.03	8.84	8.99	8.89
- pigs	13.81	16.19	16.34	16.16	17.23	17.22	17.26	18.82

- sheep and goats	18.58	20.2	21.5	21.77	21.99	21.82	22.86	24.18
- poultry	357.47	374.69	388.96	404.55	433.7	449.3	473.39	495.85
Farm output index (in comparable prices; percentage vs. the year preceded)	101.6	103	103.3	110.8	101.4	88.7	123	95.2

^{*} According to Russian Federal State Statistics Service. Available at www.gks.ru (accessed March 2014) [4].

A number of regions (oblasts) passed legislative acts aimed at the development of individual branches of agriculture and its complex re-equipment. Combined with the adequate funding, this allowed to achieve a positive result. Over the last 7 years the machine and tractor fleet has been promptly re-equipped, prerequisites have been created for raising cattle population. During this period, the cost of fixed assets in agriculture increased 2.3 times (table 4). For example, in Novosibirsk region, state and institutionary programs realization allowed to launch big projects for the construction of livestock-breeding and vegetable production complexes, appreciable reequipment of machine and tractor fleet with modern resource-saving and high capacity machinery. It was in 2012 that farm commodity producers of the region purchased 1300 units of equipment and farm machinery.

Index 2005 2006 2007 2008 2009 2010 2011 2012 Fixed assets available in RF agriculture, 1440.1 1574.7 1963.3 2259.6 2566.9 2859.9 3127.2 3332.1 bln.rub. Investments in fixed assets, bln.rub 142.3 224.2 399.7 325.2 303.8 446.9 473.4 338.5 Dynamics of agricultural fixed assets changes 98.2 99.6 101.9 101.7 101.3 101.1 100.8 101.5 at year-end (in comparable prices), %

Table 5: Renewal of fixed assets in RF agriculture

However, the change in dynamics of separate regions advance does not allow to appreciably change the situation in the industry. The growth of investments in fixed capital barely allowed to stop reducing the tangible base of agriculture. Seen the cost of fixed assets at comparable prices, there has been, on average, 1% gain in the growth over the past five years (table 5), which is not enough to overcome the technical and technological gap that has been formed over 15 years of economic reforms [8].

Nowadays, 458 agricultural enterprises of different ownership forms operate in Novosibirsk region. Among them, the most efficient are the farms that make a substantial contribution to the formation of the industry gross product. Thus, during the year 2012, Novosibirsk region sold farm produce for the sum of 28.5 bln. rub., of this sum, 6.7 bln. rub. referred to the produce obtained by ten biggest agricultural organizations. The total area of agricultural lands occupied by the organizations makes up as little as 2.13%, as for a total of cultivated land, it constitutes 3.49% (table 6).

A total of basic assets accounts for 7.9 bln.rub., which constitutes 17.91% of the total, are consolidated in ten biggest enterprises of Novosibirsk region. Due to this, labor productivity at these enterprises is 1.6 times higher (1193.15 rub. / pers.) than the analogous index for the region. The cost of basic production assets per one employee is almost 2 times higher than the mean indexes and in 2012, it made up 2080.64 tsd.rub./pers.

Table 6: Contribution of ten biggest organizations to the agricultural output in Novosibirsk region (data of 2012)

Index	For the entire Novosibirsk region agriculture	Ten biggest and efficient agricultural organizations	Specific weight of ten most efficient agricultural organizations
Average yearly number of employees, pers.	39898	5091	12.76
Agricultural lands, tsd.ha	4406123	93755	2.13

^{*} According to Russian Federal State Statistics Service. Available at www.gks.ru (accessed March 2014).

Cultivated area, tsd.ha	1881932	65634	3.49
Earnings from the produce and service sold, mln.rub.	28498.7	6661.1	23.37
incl.: crop output	6739.0	543.5	8.06
livestock output	19940.2	5695.2	28.56
other types of activity	1819.5	422.4	23.22
Revenue from the produce and service sold, mln.rub.	2716.8	846.2	31.15
Accounts payable, mln.rub.	26873.1	5594.7	20.82
Cost of basic production assets averaged over a year,	44226.7	7923	17.91
mln.rub.	44220.7	1923	17.91
Cost of produce sold, mln.rub.	25781.9	5814.9	22.43
Total energy capacities, tsd.hp	3257.3	288.8	8.87
Profitability level,%	10.54	14.55	-
Average labor productivity, tsd.rub./pers.	714.29	1193.15	-
Cost of fixed assets per 1 employee,	1108.49	2000.64	
tsd.rub./pers.	1108.49	2080.64	-
Grain crop productivity, metric centner/ha	9.6	16.3	-
Average yearly milk yielding per 1 cow, kg	3932	6600	-

^{*} According to Russian Federal State Statistics Service. Available at www.gks.ru (accessed March 2014) [4].

Owing to the employment of modern equipment and technology the enterprises were able not only to increase production efficiency, but also to create favorable conditions for employees, which permits them to attract qualified professionals every year. Average yearly number of these farms' employees made up 12.7% (5091 pers.) of the total number of those engaged in the agriculture of Novosibirsk region [9].

The use of the latest technologies in grain crop production led these agricultural organizations to obtain the productivity of the crops reaching the level of 16.3 centner/ha, which is virtually 2 times higher than the mean value for the region in 2012. The result impartially shows that applying the latest scientific and technological achievements and accurately following production technologies make it possible to obtain even in droughts, which have been observed in a series of RF entities this year, great enough output to provide financial sustainability of enterprises.

Close Joint Stock breeding-farm «Irmen» shows the highest efficiency among the enterprises examined. In 2012, earnings of the farm from the produce realized made up 1079.8 mln.rub., the profitability level being 23.9% (table 7). Among the 10 biggest enterprises of Novosibirsk region, «Irmen» employs the highest average yearly number of people; in 2012 it constituted 936 farm workers.

Table 7: Main production and financial indexes of 10 biggest and most efficient farms in Novosibirsk region (data for 2012)

Index of 10 big and efficient farms in Novosibirsk region (data for 2012)	Closed Joint Stock Agrofirma Lebedevskaya	CJS Zavyalovskoeye	CJS breeding-farm Irmen	CJS Politotdelskoye	CJS poultry-farm Novobaryshevskaya	CJS PF Posevninskaya	Open Joint Stock Kudryashevskoye	OJS PF Evsinskaya	Limited Liability Company Hothouse Complex Novosibirsky	LLC Shipunovskoye	Total
Average yearly number of employees, pers.	737	293	936	336	397	523	672	796	159	242	5091
Agricultural lands, tsd.ha	6243	15508	23097	11309	1	10600	5555	9317	-	12126	93755
Cultivated area, tsd.ha	4950	10224	15031	8150	295	10600	3883	5456	-	7045	65634
Earnings from produce sold, mln.rub.	638.3	121.7	1079.8	170.5	660.6	749.1	1956.7	848.6	315.3	120.5	6661.1

Incl.: - crop output	3.3	27.7	88.2	55.8	-	16.1	0.3	2.0	315.3	34.9	543.6
- livestock output	615.7	80.5	854.7	112.7	580.0	637.0	1935.7	821	-	58.0	5695.3
- other types of activity	19.3	13.5	136.9	2.0	80.6	96.0	20.7	25.6	-	27.6	422.2
Revenue from the produce and service realized, mln.rub.	16.7	4.6	213.9	39.3	98.1	54.8	314.0	36.7	57.5	10.6	846.2
Account payable, mln.rub.	1040.2	95.9	39.7	13.7	297.1	257.6	2429.2	447.8	853.2	120.3	5594.7
Cost of basic production assets averaged over a year, mln.rub.	317.3	315.3	1039.8	269.7	501.4	298.1	2637.0	577.0	1767.1	200.5	7923.0
Cost of produce sold, mln.rub.	654.5	115.5	894.8	137.8	579.4	696.3	1642.8	791.8	193.0	109.0	5814.9
Profitability level, %	2.6	3.9	23.9	28.5	16.9	7.9	19.1	4.6	29.8	9.8	-
Total energy capacities, tsd.hp	22.4	21.8	83.1	21.8	7.4	21.7	81.0	28.7	0.9	-	288.8
Labor productivity, tsd.rub./pers.	866	415	1154	508	1664	1432	2912	1066	1983	498	ı
Cost of fixed assets per 1 employee, tsd.rub./pers.	431	1076	1111	803	1263	570	3924	725	11114	829	-

High labor productivity of these farms is determined by applying the latest technologies and resource-saving machinery as well as by innovative means of farming. Such agricultural organizations have an effect not only on the development of the industry and food security of the country, but also on that of village infrastructure.

Far from being scarce is their sponsoring activity when they are involved in cultural events, make investments in village infrastructure development, render financial, material and some other aid to educational and preschool institutions.

High level of production efficiency and sustainability of financial indexes make it possible for big agricultural organizations to attract substantial financial resources to update and advance material and technical base. Thus, 20% (5.6 bln.rub.) out of the total accounts payable in agriculture refer to the ten biggest farms of Novosibirsk region.

The effective mechanism to encourage investments is to subsidize interest rates on loans for farm commodity producers. In some RF entities the volume of funding under the item concerned makes up to 60-70% of the total funds allocated from the federal budget. Regarding Novosibirsk region, 927.07 mln. rubles out of 1490.29 mln. rubles were submitted to perform the tasks in 2012.

Therewith, a series of negative trends is on the way to improve credit conditions, actual for today, and realize the mechanisms which encourage technical re-equipment of the industry. Thus, the total debt obligations of the agricultural organizations over the last 7 years have increased almost three times and totaled 1.43 trillion rubles. Arrears of bank loans increased 5 times – up to 1.0832 billion rubles.

Under the conditions of high-risk and low efficiency this level of debt negatively affected the financial state of many farms and over the same period of the year 2012, revenue volume of agricultural organizations grew at a slower rate. The debt level accounted for 112.3 billion rubles making further advance of the industry virtually impossible. At the current level of production efficiency, the deadline to meet credit obligations will be more than 10 years, excluding accrued interest (table 8).

Despite the appreciable updating the machine and tractor fleet and creating prerequisites for the introduction of the latest technologies, the production efficiency remained bottomed out over all the period. In 2012, profitability level made up 15.3% in crop production and 10.6% in livestock-breeding. The tendency does not give any opportunity for farm commodity producers to merely reequip the production. Moreover, it does not allow to encourage ordinary reproduction of resources.

Table 8: Assessment of financial status and efficiency of production-financial activity of RF agricultural organizations

Index	2005	2006	2007	2008	2009	2010	2011	2012
Total debt liabilities, bln.rub.	395.3	517.4	700.6	871.7	999.1	1125.7	1260.8	1431.4
incl.: accounts payable	199.8	203.1	219.7	249.9	272.3	284.5	309.6	348.2
bank loans payable	195.5	314.3	480.9	621.8	726.8	841.2	951.2	1083.2
Accounts receivable, bln.rub.	91.0	136.3	179.9	209.7	240.4	274.3	313.7	366.5
Number of organizations (at yearend), tsd.	19.8	17.6	15.6	9.0	7.8	7.2	6.8	6.4
incl.:								
profitable organizations, tsd.	11.5	11.4	11.7	7.1	5.7	5.2	5.2	4.7
% of organizations total	58.3	64.7	74.9	78.5	73.0	72.1	76.8	72.6
reported profits, bln.rub.	61.6	75.1	113.5	115.5	98.7	111.0	131.7	156.8
unprofitable organizations, tsd.	8.3	6.2	3.9	1.9	2.1	2.0	1.6	1.7
% of organizations total	41.7	35.3	25.1	21.5	27.0	27.9	23.2	27.4
reported loss, bln.rub.	31.3	27.4	19.9	24.2	35.3	44.2	32.8	44.5
Profitability of sold goods, produce (works, services) in crop production, %	6.4	10.6	23.1	17.5	9.1	12.4	14.2	15.3
Profitability of sold goods, produce (works, services) in livestock- breeding, %	9.5	8.1	9.1	7.5	9.6	8.6	7.6	10.6
RF inflation rate, %	10.91	9.00	11.87	13.28	8.80	8.78	6.10	6.58

^{*} According to Russian Federal State Statistics Service. Available at www.gks.ru (accessed March 2014).

Over the period examined, the number of agricultural organizations reduced from 19.8 to 6.4 thousand, most of them went bankrupt and the number of loss-making enterprises in the general structure went up to 1.7 thousand units in 2012. The number of profit-making farms decreased 2 times, their production efficiency growing virtually *pro rata*. The average profit per 1 profitable organization accounts for 33.4 mln.rub., the average loss per 1 unprofitable organization is 21.1 mln.rub.

Novosibirsk region positive experience of the support for investment projects on material and technical re-equipment in the industry via regional budget subsidizing up to 50% of the new equipment cost has some considerable restrictions. It is the organizations with no arrears of wages, taxes and levies for off-budget funds that can be supported. Only 30-50% of the farms were able to make use of the institutionary program during the period of its implementation.

Herewith, the funds are returned as repaying bank credits in equal installments. For example, given an organization purchases machinery with 3 mln. rub. of its equities and 7 mln.rub. of the funds borrowed, Novosibirsk region Ministry of Agriculture can make up for only 1.5 mln. rub. (50% of 3 mln. rub.), but the rest of the money is reimbursed as the credit is called in and this can take long. Therefore, the greatest promoting effect is achieved only when buying modern machinery with the equities or the funds of private investors. Under current economic conditions of agricultural production, there are little monetary means available and private investors are reluctant to invest because of low profitability and high risks.

The terms of state regulation of food market and agricultural support are amended in accordance with the WTO rules and call for the developed level of public funding to reduce from \$9 bln. in 2013 to \$4.4bln. in 2018. Considering this reduction conjugated with the annual growth of price disparity, the actual funding for the agrarian sector of economics will be no more than 1/3 of the current level.

In the view of the fact that the farm output is 5.9% averaged over GDP and the agriculture employs 5.2 mln. people, the increase of public and private investments in technical and technological modernization and re-equipment of the material-technical base shall, in a short time, improve rural people's welfare, create new jobs and ensure food safety. However, there has been, as yet, no effective mechanism to promote private investors.

Low investment attractiveness of the industry is determined by high risk and almost zero return on the capital employed. Most projects pay off only 5-10 years later and provide a 7-15% return, which makes them non-efficient versus the risk.

In our opinion, if the state provides private investment-back guarantees and rate of return on capital of 10% per year, the interest in agriculture will be aroused in big industrial organizations and private investors, including foreign ones.

The technique developed by the authors to attract private investments in major investment projects to implement in agriculture is represented in the figure and includes several stages.

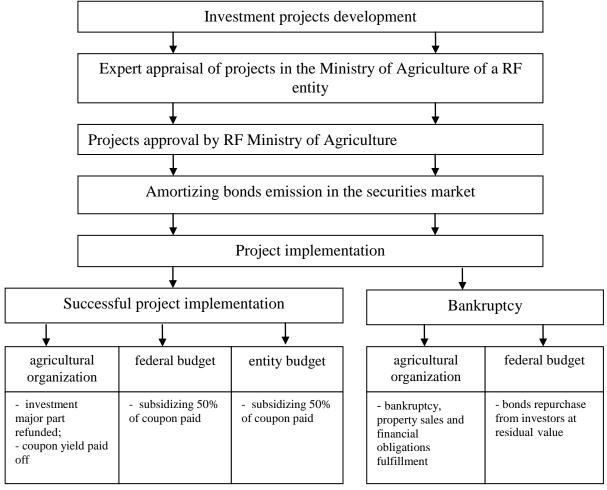


Fig. 1: Techniques to attract private investments in major investment projects to master scientific and technological achievements in agriculture

At the initial stage, agricultural organizations work out investment projects and submit them to regional ministries of agriculture where they undergo expert appraisal for the following criteria:

- the level of enterprise bankruptcy risk in the project;
- anticipated economic effect;
- project payback period;
- investment-back guarantees;
- amount of equity investments;
- social importance of the project (employees' income growth, creation of new jobs, development of rural infrastructure, etc.);

- tax revenue entry to the budgets of all the levels;
- assessment of the current financial status in company

After perspective projects are selected, they are submitted to RF Ministry of Agriculture to approve.

Further on, amortizing bonds are placed in the securities market for each of the approved business-plans and this is done on the analogy of RF entity loans placement. It is reasonable to establish the level of coupon yield not less than 10% per year for the category concerned. Considering the characteristics of agricultural production, the principle debt will be paid back in equal installments over the entire period of securities circulation in the market.

Because of the low production efficiency, investors' income has to be secured by the federal budget and the budget of RF entities at the level recommended on the analogy of partial subsidizing the interest rate on bank loans. The budgetary funds have to be allotted on the basis of joint security: 50% - the federal budget, 50% - the RF entity budget.

In the event of enterprise bankruptcy the bonds are repurchased from the investors at residual value, at the expense of the federal budget. To realize the techniques proposed will make it possible to appreciably increase the amount of investments in agriculture and the number of big investment projects for production organizing and farm output processing, the cost value of the projects exceeding 100 mln.rub.

Date	Coupon rate	Par bond	Redemption at par value	Coupon amount
15-30.12.2014		Placement in th	e stock market	
31.12.2015	10%	1000	200	100
31.12.2016	10%	800	200	80
31.12.2017	10%	600	200	60
31.12.2018	10%	400	200	40
31.12.2019	10%	200	200	20
Total			1000	300

Table 9: Return of private investments (ROPI) over the investment project implementation

The calculations show that to attract 100 mln.rub. private investments of a 5-year return period according to the technique proposed will cost 30 mln.rub. for the state (15 mln.rub. for the federal budget and 15 mln.rub. for the RF entity budget). Given the average annual inflation rate 7.6% over the last 5 years, this is acceptable (table 9).

The mechanism to attract financial resources with the technique concerned will be as follows (fig. 2).

Interval unit investment fund (UIF) is being set up on the basis of OJS «Rosselkhozbank». The aim of the fund is to invest the deposited funds in major projects to modernize agricultural production or establish new enterprises on the basis of applying the latest scientific and technological achievements. Depositors may be private investors, business organizations and other big investment funds, including foreign ones. The UIF characteristic is that the fund shares are bought and sold not every day, but, in our event, once a year on December 15-30. This will permit the UIF not to keep part of the cash means in the accounts to perform unscheduled refund for a shareholder, but invest them in projects in full.

After closing the buying interval, one or more projects are chosen which have already been selected by the Ministry of Agriculture to invest in amortizing bonds. The main advantage of such bonds is to refund the principle debt in equal installments during all the period of their circulation. Annual inflow of cash means to the UIF account after coupon yield paid and debt partly redeemed will allow the management company to meet its obligations for shareholders and expand an investment portfolio.

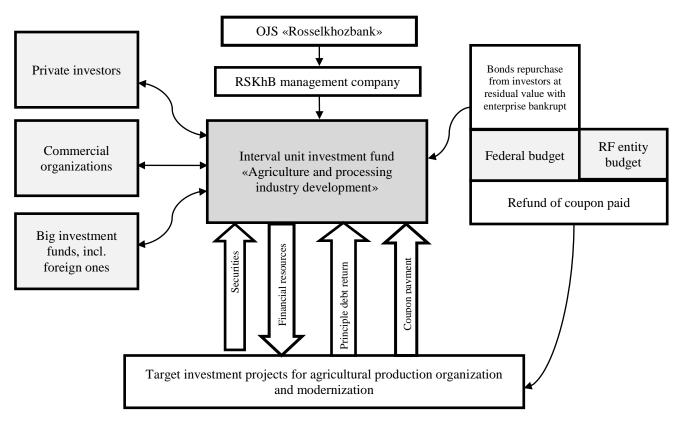


Fig. 2. Mechanism to attract financial resources in the frameworks of complex projects implementation to master scientific and technological achievements

A part the state plays in the mechanism involved is to perform the function of a guarantor that undertakes the obligation to pay the damages of the fund in the event of bankruptcy of the investment object recommended through repurchasing the bonds from the one at residual value.

Additional incentive effect will be achieved by subsidizing agricultural organizations at the expense of the coupon paid. Expenditures of this area should be equally shared by the budgets of RF entities and the federal budget.

The mechanism proposed and operating in Novosibirsk region to attract financial resources allows to use state support for technical modernization of agriculture and receive a 50% subsidy of the total costs in full, which is not possible when using a bank loan. This makes it possible to develop financial resources back up in the first year of the project that is sufficient to sink the debt (amortized deduction of par bond) for 2.5 years. Over this period, an agricultural organization can implement the innovative project of technical and technological re-equipment and reach the targeted indexes of production volume.

Efficiency to attract private investments in the mastering of scientific and technological achievements and technical and technological re-equipment of agriculture is evidenced by a great many projects. For example, since 2012 four big projects have been implemented in Novosibirsk region, the total cost having been nearly 8 bln.rub. The implementation significantly enhanced the efficiency of agricultural production and created the points of GDP growth in the agriculture of the region.

The first project has been implemented since the year 2011 at the enterprise OJS «Kudryashevskoye", it aims to expand and modernize the operating pig-breeding complex. The volume of investments attracted makes up 2.3 bln.rub. After the project is terminated, it is planned to double its production capacities. At the initial stage of the project implementation the company's earnings were 2 bln.rub. (table 10).

Table 10: Economic efficiency indexes of the OJS «Kudryashevskoye» at current stage

Index	2010	2012
Number of employees, pers.	1010	672
Earnings, tsd.rub.	2125965	1956712
Net profit, tsd.rub.	226133	313958
Tax obligations, tsd.rub.	42073	92466
Principle debt on credits, tsd.rub.	1437619	1734186
Costs of labor payment, tsd.rub.	209618	212278
Average yearly labor payment, tsd.rub.	208	316
Contributions to off-budget funds, tsd.rub.	36125	41098

The second project aims to build a livestock complex for the milking population of 3600 heads at OJS «Chernovskoye» in the structure of the management company of agroindustrial holding OJS «Raduga». Project implementation period is 2011-2013, the cost is 2.674 bln.rub.

Table 11: Efficiency of the investment project implementation at OJS «Chernovskoye»

Index	2010	2011	2012
Number of employees, pers.	393	391	358
Earnings, tsd.rub.	208514	294211	406812
Net profit, tsd.rub.	51905	31045	22937
Tax obligations, tsd.rub.	4255	3196	9302
Principle debt on credits, tsd.rub.	241308	329492	267511
Costs of labor payment, tsd.rub.	41083	47191	42578
Average yearly labor payment, tsd.rub.	105	121	119
Contributions to off-budget funds, tsd.rub.	8476	9470	8737

Implementation of the project concerned allowed to increase the amount of earnings two times over as little as 2 years (from 208 mln.rub. in 2010 to 406 mln.rub. in 2012). The decline in net profit, the amount of which was 23 mln.rub. in 2012, is determined by fulfilled financial obligations to creditors (table 11).

The third project has been implemented: a hothouse complex was built with its 17.24 ha area to cultivate vegetable crops; it is limited liabilities company Teplichny combinat (hothouse complex) «Novosibirsky». The amount of investments for the period 2008-2012 made up 1.8 bln.rub.

Table 12: Efficiency of the project implementation on building the hothouse complex «Novosibirsky»

Index	2010	2011	2012
Number of employees, pers.	-	86	159
Earnings, tsd.rub.	491	124399	315245
Net profit, tsd.rub.	1072	8937	57507
Tax obligations, tsd.rub.	=	62792	61703
Principle debt on credits, tsd.rub.	319606	630279	1225663
Costs of labor payment, tsd.rub.	4674	30374	53934
Average yearly labor payment, tsd.rub.	=	353	339
Contributions to off-budget funds, tsd.rub.	-	5025	10080

Implementation of the project concerned allowed to create 159 jobs with average yearly labor payment at the level of 339 tsd.rub., which is 2.5 times higher than the mean value for the industry. The cost of produce sold when reaching the production volumes planned constituted 315.2 mln.rub. The project concerned allowed to increase tax revenue entries to budget and off-budget funds by 71.8 mln.rub. over as little as 2 years (table 12).

Implementation of the fourth project as well as the first one is in progress. Ltd company «Sady Giganta» started the construction of agrarian complex with a 7 ha- area hothouse farm and a vegetable storage facility of 13 tsd. ton capacity in 2010. The deadline of the project is August, 2015. The total cost of the project is 1054.0 mln.rub.

Table 13: Performance efficiency of the agrarian complex ltd. company «Sady Giganta»

Index	2012
Number of employees, pers.	38
Earnings, tsd.rub.	187223
Net profit, tsd.rub.	1168
Tax obligations, tsd.rub.	460
Principle debt on credits, tsd.rub.	502780
Costs of labor payment, tsd.rub.	10884
Average yearly labor payment, tsd.rub.	286
Contributions to off-budget funds, tsd.rub.	2510

In 2012, some production facilities were introduced in the hothouse complex. This allowed to obtain the inflow of additional funds and promptly occupy a niche in the market of Novosibirsk city with its 1.5 mln. population. The cost of produce sold made up 187.2 mln.rub. this year (table 13).

Conclusions

- 1. The increase in investment attractiveness of Russia's agriculture will allow to develop an impetus for enhancing the innovation advance of the industry and transmitting to the new technological setup. This will considerably improve agricultural efficiency and competitiveness in the global food market ensuring the growth of the gross domestic product of the country and the welfare of most population residing in rural territories.
- 2. The proposed techniques to attract additional investments are a synergic supplement for existing legislation to support farm commodity producers and encourage a sustainable advance of the industry.
- 3. To create favorable conditions for private investors permits to appreciably enhance the inflow of financial resources to Russia's agriculture and to implement big projects for comprehensive mastering scientific and technological achievements, thus intensifying the advance of the industry.

References:

Polukhin A.A. Approaches for justification strategy technical modernization of agriculture given the characteristics of agricultural development and resource provision subjects of the Federation / A.A. Polukhin // Russian journal of agricultural and socio-economic sciences. 2013. Vol. T. 24 (12). P. 22–27.

Матвеев Д.М. Управление технологическими процессами в сельскохозяйственных организациях / Т.А. Стадник, А.Т. Стадник, Д.М. Матвеев. Новосибирск: изд-во ЭКОР-книга, 2011. 245 с.

Можаев Е.Е. Развитие научно-технического прогресса в сельскохозяйственном производстве. М.: изд-во Спутник, 2010. 267 с.

Official site of Russian Federal State Statistics Service. Available at www.gks.ru (accessed March 2014).

Stadnik A.T. Boosting the investment attractiveness of agricultural production / D.M. Matveev, A.T. Stadnik, D.V. Menyaykin // World Applied Sciences Journal. 2014. Vol. 31(8). P. 1535-1539.

Malyshkov V.I. Some aspects of the effective relations between government and business / V.I. Malyshkov // Life science journal, 2013. Vol. T. 10 (4). P. 2679-2682.

Lavrinenko P.A. Analysis of the investment attractiveness of projects in the field of environmental protection / P.A. Lavrinenko // Studies on Russian economic development. 2013. Vol. T. 24 (5). P. 495-499.

Bokusheva R. Dynamics of productivity and technical efficiency in Russian agriculture / R. Bokusheva, H. Hockmann, S.C. Kumbhakar // European review of agricultural economics. 2012. Vol. T. 39 (4). P. 611-637.

Матвеев Д.М. Техническое и технологическое переоснащение сельского хозяйства необходимо / А.Т. Стадник, Д.М. Матвеев, М.Г. Крохта, П.П. Холодов // АПК: экономика, управление. – 2012. – N^0_2 5. – С. 68-71.

Copyright © 2014 by Academic Publishing House Researcher



Published in the Russian Federation European Researcher Has been issued since 2010. ISSN 2219-8229 E-ISSN 2224-0136 Vol. 81, No. 8-2, pp. 1546-1550, 2014

DOI: 10.13187/er.2014.81.1546

www.erjournal.ru



Problems and New Attitudes of Business Evaluation for M&A in Kazakhstan

¹ Sanam S. Mirzaliyeva ² Ilyas N. Rakhimzhanov

¹ International Educational Corporation, campus of Kazakh-American University, Kazakhstan Almaty, Toraygirova str. 29

PhD, Associate Professor

E-mail: sanam-mirzalieva@mail.ru

² International Educational Corporation, campus of Kazakh-American University, Kazakhstan

Almaty, Toraygirova str. 29 E-mail: ilyas32-33@mail.ru

Abstract

The main aim of the article is to look through the market of business evaluation for M&A in Kazakhstan. Nowadays Kazakhstan is standing at the inception of the development of M&A market; however, economy of country is rapidly growing, thus assuming a high level of knowledge and experience in M&A issues. Therefore, new legislations are being applied; various methods and attitudes are starting to be used in cases of M&A evaluation. For this reason, the topic is highly efficient for developing M&A specialists and is as relevant as ever.

Keywords: Kazakhstan; mergers and acquisitions; development; attitudes; evaluation; economy; economic growth, legislation, business.

Introduction

Until recently, the market for mergers and acquisitions in Kazakhstan was inactive, but the growth and development of markets significantly raised the investment attractiveness of Kazakhstan. Our republic, as well as any country in the world, has its own characteristics, stages of development and background of mergers and acquisitions. Major drivers of the market of mergers and acquisitions in the Republic of Kazakhstan are high economic growth in the CIS, a good investment climate, rich raw material base. In this regard, topic is going to give consideration to a significant branch of development of our country – mergers and acquisitions market.

Materials and methods

The information and materials in the article are mainly based on legislations of evaluation and M&A regulations, approved by Kazakhstan's Government, surveys and statistics from openaccess resources, as well as books and articles of Russian, Kazakhstan and other authors.

Discussion

In August 7, 1997 by the order of the Ministry of Labor and Social Protection of the Republic of Kazakhstan, qualifications for persons professionally engaged in the valuation of the property were approved; thereby the new profession "appraiser" was officially recognized [1].

Currently in Kazakhstan, relations arising from the valuation activities in order to establish market value of objects, defining the rights and responsibilities of evaluation activities - are governed by the Law of the Republic of Kazakhstan dated 30th of November 2000 № 109 - II "On valuation activities in the Republic of Kazakhstan" (with alterations and amendments on 13.01.2014). Legislation of the Republic of Kazakhstan on the valuation activities is based on the Constitution of the Republic of Kazakhstan and consists of this Law and other legal acts of the Republic of Kazakhstan [2].

According to this Law, subjects of valuation are professional appraisers with specialized knowledge and skills, customers and third parties. Evaluators (or appraisers) are individuals who have the right to engage in evaluation activities, in accordance with the Act, on the basis of an employment contract with a legal entity engaged in valuation activities; either alone as a sole proprietorship under license in accordance with the legislation of the Republic of Kazakhstan "On Licensing" [3].

In the current conditions of high market competition, companies need to look for the most effective methods for business development, competitiveness, profitability and growth in value. Currently, one of the most effective ways to develop company – is to use strategy of mergers and acquisitions (M&A). The implication of this strategy is the effect of synergy - excess of the cost of associated companies over their cost separately. This occurs as a result of elimination of overlapping functions and through access to new markets, new technologies, and improvement in organizational production cycle. There are two types of synergy: operational and financial. Operating synergies are advantages affecting the core activities of both companies (such as economies of scale and improvement of the ability to influence the price). This kind of synergy is usually manifested in increasing cash flow from the business. Financial synergy includes tax advantages, diversification, improvement of creditability, etc. This synergy can be shown in increasing cash flow and reduction of business risks [4].

One of the key steps in M&A procedure is the estimation of the target company and the size of synergy. There are three evaluation approaches, which are mostly used in foreign practice:

- Profitable method;
- Costly method;
- Comparative method.

Comparative evaluation of the target company is compared to peers on various parameters. In this case, peers have a cost, as previously defined. Note the following disadvantages of this approach:

- Absolutely identical companies do not exist;
- Comparative approach does not allow to identify potential sources of synergy;
- Comparative approach cannot be applied to non-public companies.

The cost approach is based on the definition of the expenditure required for reproduction or replacement of the subject being evaluated, taking into account its wear. This approach ignores the value of intangible assets, which are typical for any business, which is why the definition of full-size synergy becomes impossible.

The main method of evaluation of M&A is a profitable approach, which determines the cost based on estimates of future cash flows.

The income method involves the conventional division of the total period of the company into two periods: the period of forecasting and post-forecast period. It is assumed that during the forecast period there are significant changes in the company's operations and financial results (for example, strong growth in sales volumes). The terminal period begins after the stabilization of the financial performance of the company [5].

Nowadays, all these evaluation methods are starting to be used on the new growing field of M&A in Kazakhstan, taking experience of international appraisers into account.

In Kazakhstan, the revival of the market of mergers and acquisitions began to happen a few years ago, when foreign investors have begun to show the most activity in acquiring assets in

Kazakhstan, while currently the market of mergers and acquisitions in country is at an early stage of its development, having a great potential for further development.

Due to the fact that the companies, that are involved in the mining sector, have received much attention from foreign investors, because of high prices on oil and precious metals, as well as due to higher professional level of managers and improve of shareholder culture among local investors, it may be noted that State's M&A market, acting in the role of the subject in these processes, does indirectly stimulate transactions in mergers and acquisitions.

Analyzing the specifics of this market, we can note the information secrecy of local companies, because for a business owner who wants to sell its assets, there is a risk of information leakage. So, in this kind of transaction, business owners are trying to carry out without the help of brokers or financial advisers, which is often problematic. There we can identify some problems such as: undeveloped share market - companies are still not transparent in terms of financial reporting and decision-making. Strong affiliation of the companies with financial-industrial groups is noticeable, and it is underdevelopment of effective corporate governance, plus a reluctance to change the situation [1, 6].

When market research analysts use different valuation techniques, they eventually figure that numbers in different companies can vary. However, the real market volumes significantly higher than current estimates of experts. So the main problem of objective analysis of this sector is its secrecy. Study affects only those transactions that have been committed officially from public disclosure. Basically, this applies only to large transactions, small and medium-sized businesses are not present in the annual reports.

Within a short period of development of M&A market, it may be noted that the number of successful transactions in mergers and acquisitions in this country more than the world average, but this is often due to the fact that it is non-standard transaction. Most of them took place in an environment where the purchased asset is undervalued, due to, for example, political risks or adverse conditions while some assets were bought not at fair value (lack of assets evaluation).

Trend of rapid seizure of assets that is found in Kazakhstan, where companies do not come from motivation, consistent with the development strategy of its own, but rather from desire to capture as many resources as they can, to form conglomerates, which obsoletes with time. That's because this method of getting resources and construction of activities only through the expansion of assets - is not economically viable. Example of more developed countries will recur: eventually the principle of growth of conglomerates will held by the growth efficiency of existing assets and activities of its core activities [6].

Over the next few years, Kazakhstan expects another stage where economic laws will begin to work on a standard scenario, while the growth rate of the market won't reduce. Desire to expand markets or geographical expand, access to new financing – it will all remain the same. New rules set by market will zoom in our country to the world trend, where two thirds of transactions do not bring the companies increase in capitalization and make them pay attention to the internal factors of the merger.

In view of the fact that many sectors of Kazakhstan are in the early phase of its development, and companies are owned and operated by the owners, a large number of mergers are not observed, because usually merger is a transaction of equal to try to improve their competitiveness. These transactions often occur in the later stages of the industry growth and in a developed capital market. In Kazakhstan transactions primarily occur in format of "acquisitions".

Mergers and acquisitions market - is primarily a process of globalization, therefore, it is not surprising that in our country, the development of the market is held with a significant participation of foreign capital. Foreign investors set the good pace of market development, and its dynamic development in Kazakhstan will probably not abate in the future, and moreover, the market will evolve and expand - with the development of capital market, transactions will be more transparent. Public companies, that put their shares on the market, will provide more information about their selves, which can make them an object of interest for mergers and acquisitions [7].

In recent years, Kazakhstan has the growth of markets in almost all commodity groups, which, in particular, will cause the market to follow the Russian experience - new branches will be activated, in addition to oil production and mining sector.

In industries oriented to the consumer sector - retails, consumer goods production and the food industry has a very large potential. Analysts also see horizons in the service sector, hotel and

the food industry which are now rapidly growing. In any case, M&A is an important indicator of the evolution of business in our country and outside involvement in the processes of integration of Kazakhstan into global businesses.

In a very short time, retailers will develop in the regions, absorbing regional players. And after the industry the main part of the leaders will be formed, merger of major players will begin, entering Western chains on the market of Kazakhstan, by purchasing locals. Investors are attracted by absence of serious domestic constraints from powerful financial-industrial groups in the retail sector, services, infrastructure and construction.

The feature of Kazakhstan is a fragmentation of the market in most sectors. Taking retail as an example. There are no uniformed retailers network in Kazakhstan, just a few well presented in two or three cities - market presents a large number of disparate stores of various sizes, a set of goods and various standards. Buyer needs recognition and uniformity (for example Turkish retailers – "A101", "Şok", etc.). Therefore, the consolidation will increase. Growing consolidation in other market segments are not excluded as well.

The promising sector in this regard is the mining sector. Currently there are many small steel companies in Kazakhstan that produce zinc, gold, they all can be targeted for takeover. For all the major players in this sector, today's topical issue is diversification and the creation of large metallurgical holdings.

Since M&A market is a good indicator of economic development and reflects the main trends occurring in it, the main interest of mergers and acquisitions are seen in industries such as oil and gas, mining, cement, telecommunications and financial industry. Most attractive for M&A transactions are the objects of the fastest growing sectors of the economy in which there are a large number of players. For example, Chinese and Indian investors, followed by the U.S. and Russian investors, are very active in the acquisition of oil and gas companies and fields due to the huge struggle of the world's energy reserves [6, 7].

Recently, the Kazakh media began to pay attention to such problematic aspects of our economy and legal reality, as raiding - the seizure of power business, which migrates to us from other countries. If this phenomenon is not put serious barrier - irreversible consequences will occur, that will affect our external policy. In Britain, for example, there were only two companies were raid, after which the British House of Commons quickly passed a law, and two months later the House of Lords approved it, and there were no more incidents. Raiders - is a new issue for our business, which only began to rise from the knees and come out of the shadow [8].

Corruption involvement in the process of law enforcement agencies and the judiciary - characterizes hostile takeovers in Kazakhstan. Today even Kazakhstan Law contains no definition of "illegal acquisition". There are no universal prescriptions to combat hostile takeovers, because each acquisition is unique.

Three main options of hostile takeovers developed in Kazakhstan:

- Control over the management of the enterprise or a person representing the interests of large shareholder;
 - The acquisition of a control stake;
 - Bankruptcy of the company, followed by the acquisition of its assets.

The raiding problem in Kazakhstan - as already noted, is mostly the problem of corruption and inadequate legislation.

To strengthen the role of law in preventing and efficient settlement of corporate conflicts, careful and meticulous work is required to improve Kazakhstan's corporate law (corporate governance), as well as procedural law [6].

According to experts, the complete ban of "hostile takeovers" by legislation method will lead to the fact, that shareholders of enterprises can become hostages to their managers, which generally have a negative impact on the economy of the state as a whole. Currently, this problem is particularly acute in large cities. After all, the aim of the process of mergers and acquisitions is to obtain control over the business as a whole or of the assets of the enterprise. It would be a mistake to believe that this goal is achieved only by consistent buying shares, bringing stake to a controlling share, changing management of enterprise, if necessary - reorganization or transactions aimed to the withdrawal of the Company's assets. This process is extremely time consuming and expensive, and this reduces its attractiveness to potential investors, and in order to avoid this time-consuming procedure, many methods and schemes are used in practice, which are not connected with the

criminal law topics, and are based on current corporate law, partly by his problematical and contradictory [9].

Conclusion

Analysis of mergers and acquisitions market revealed the following problems of development in Kazakhstan:

- "Super-concentration" of the property the largest shareholders are trying to secure a stake of at least 75%;
- Underdeveloped institutions of professional consultants in the market, the role of which is operated primarily overseas by investment banks;
- Reluctance of the public, and in many ways the environmental authorities to learn to distinguish professional from criminal who uses the cover;
 - The problem of the existence of "raids";
 - Absence of legislative developments;
 - Opacity information about many domestic transactions;
- Local investors usually do not use the services of experienced financial and legal experts in the process of negotiating [7].

In the future, the growth of mergers and acquisitions in the banking sector and underdeveloped sectors is expected. The banking sector will be reduced by decresing the number of small banks. Undeveloped sector can begin to develop, if the foreign companies absorb them, or if they begin to merge with each other.

In the end, Kazakhstan will repeat the development of this market by foreign experience when conglomerates will not want to spend money on mergers and acquisitions, but will be developed by increasing domestic productivity.

References:

Сыздыкова Э.Ж., Шакенова Г.А. Посткризисные ориентиры социально-экономические и инновационного развития Казахстана. Караганда, 2010, С. 12-13

Закон Республики Казахстан от 30 ноября 2000 года № 109-II «Об оценочной деятельности в Республике Казахстан»

Закон Республики Казахстан от 11 января 2007 года № 214-III «О лицензировании»

Бодров К., Шахова Д. М&А: Оценка в целях слияния и поглощения. [Электронный ресурс] //СМАО, URL: http://smao.ru/ru/company/contact.html (дата обращения 7.08.2014)

Brian Coyle. Mergers and Acquisitions. Global Professional Publishing. 2000, 140 p.

Касимова М., Галижапаров А., Жимайлова Б., и др. Научно – исследовательская работа в рамках программы «Жас Ғылым», Павлодарский государственный университет им. С. Торайгырова, 2009, 51 с.

Салихова А. Рост без неожиданностей // Эксперт РА Казахстан. №22, 3-9 июнь 2013 г. [Электронный ресурс] URL:http://www.raexpert.kz/ (дата обращения 7.08.2014)

Грачев В.А. Враждебные поглощения: Типология и способы защиты. //Акционерное общество: вопросы корпоративного управления. №7 июль 2006г. [Электронный ресурс] URL:http://www.advisers.ru/file/advisers/Vrag_pogl.pdf (дата обращения 5.08.2014)

Ryngaert M. The Effect of Poison Pill Securities on Shareholder Wealth. Journal of Financial Economics, University of Florida, USA, 1988

Copyright © 2014 by Academic Publishing House Researcher



Published in the Russian Federation European Researcher Has been issued since 2010. ISSN 2219-8229 E-ISSN 2224-0136 Vol. 81, No. 8-2, pp. 1551-1560, 2014

DOI: 10.13187/er.2014.81.1551

www.erjournal.ru



The Effects of Domestic Macroeconomic Determinants on Stock Returns: A Sector Level Analysis

Şerife Özlen

Ishik University, Iraq Business and Management Department, Erbil E-mail: serife.ozlen@ishik.edu.iq

Abstract

Investment analysis should be carefully performed in stock markets. Therefore, firms take necessary actions according to stock market behavior and macroeconomic variables. Therefore, the predictability of stock market determinants becomes important. This study aims to identify the effects of selected macroeconomic factors (interest rate, exchange rates, inflation-consumer price index, current account deficit, unemployment rates and sector indices) on stock returns of selected 48 companies in 11 different sectors of Istanbul Stock Exchange including electric, food, communication, paper, chemistry, metal-main, metal-product, stone, textile, commerce and transportation sectors. The study employs ARDL approach on the period between the second month of 2005 and the second month of 2012 including 85 monthly observations. According to the results, **Sector Indices** are found to be quite influential through the selected sectors. **Exchanges** rate is also significantly influential on almost all the sectors except Communication and Textile sectors. The impacts of Interest Rate, Inflation Rate, Current Account Deficit, and Unemployment Rate are various through the selected sectors. Moreover, the influence of Istanbul Stock Exchange Market on the stock returns of considered companies is significantly clear through the sectors except six companies (two companies from Paper sector, one company from Metal-Main sector, two companies from Stone sector and one company from Textile sector) out of 48 companies. Since it includes a wide range of companies and sectors, this study is expected to be useful for all policy makers and investment decisions.

Keywords: Macroeconomic factors; Sector level analyses; ARDL; ISE.

Introduction

Firms' stock market policies are becoming more and more important for the influences of macroeconomic variables. Fluctuations in macroeconomic variables affect business negatively by disturbing the tendency of the trade smoothness. Therefore, the predictability of stock market determinants becomes important. On the other hand, according to some studies, the predictability ratio has decreased for the last two decades (Lewellen, 2004; Cochrane, 2008).

The role of macroeconomic variables in asset pricing theories is accepted as important for financial analysts and policy makers. Therefore, many attempts are empirically performed in order to identify the link between macroeconomic variables and stock market volatility. Researchers (such as Errunza & Hogan, 1998; Hamilton & Lin, 1996; Schwert, 1989) observe that stock market

volatility are linked to business cycle fluctuations. Investors, macroeconomists, politicians, and central bank managers want to better understand potential macroeconomic determinants of systematic financial-sector risk and business-cycle fluctuations in order to forecast stock market volatility.

Every country and stock exchange market have unique determinants specific to them. Therefore, for the same considered variables, they may have different responses. According to Fama (1990) and Binswanger (2000), Stock markets are mainly affected by the surrounding economy and useful to predict future economic conditions. Modern Portfolio Theory (MPT) argues that market risk is the key influencing factor of the equity prices. MPT asserts that an efficient set of portfolios can be constructed in order to offer the maximum possible expected return for a given level of risk (Markowitz, 1952). Sharpe (1964), Lintner (1965) and Black (1972) presented the capital asset pricing model as an extension of this theory by arguing that market risk cannot be diversified away, therefore it is the only risk in the pricing of a financial asset. However, Ross' (1976) arbitrage pricing theory (APT) becomes popular in developing multifactor models to explain stock returns. The APT is assumed to work only under perfectly competitive market.

One of the advantages of the APT, when compared to the CAPM, is enabling the market portfolio as a proxy which is not possible for the CAPM (Roll, 1977). When using the APT, this proxy which makes the APT easier to test empirically is not particularly important (Huberman, 1982). Researchers are aware that there is a need to add more than one factor before the APT is introduced. Brennan (1971) finds that minimum two factors should be used in an asset pricing model.

As a conclusion, a number of factors may have influence on the determination of the return on stocks, but they are not exactly known. In order to explain the stock returns two of the most important and common theories are capital asset pricing model (CAPM) and arbitrage pricing theory (APT). Instead of using a single market factor, the literature suggests the consideration of different variables to explain the stock return variations. Arbitrage Pricing Theory is a multi-factor asset pricing model which can be considered instead of the traditional equilibrium based model Capital Asset Pricing Model. According to Opfer and Bessler (2004), these models basically assume that the stock returns are generated by a limited number of economic variables or factors. The CAPM may not be able to fully explain the pricing of risky assets. Therefore, as a well-known alternative, instead of single risk based models the multifactor approach can be suggested either from an arbitrage pricing theory (APT) or from a multi-beta CAPM perspective in order to explain whether the market return is the only factor to define stock returns variations and what extramarket factors should be considered when investigating stock returns volatility. Furthermore, conditional means and variance in financial data can be applied in econometric analysis of financial markets.

This study aims to identify possible influences of some domestic macroeconomic variables (interest rate, exchange rates, inflation-consumer price index, current account deficit, unemployment rates and sector indices) on the selected 48 companies in 11 different sectors (electric, food, communication, paper, chemistry, metal-main, metal-product, stone, textile, commerce and transportation sectors) of Istanbul Stock Exchange (ISE) by employing an ARDL approach.

Literature Review

The role of financial information becomes important for the investment decisions. Because of the strong relation between economy and market, macroeconomic information may be very useful. External factors include governmental rules and regulations, inflation, investor behaviors, market conditions, money supply, competition, uncontrolled external circumstances, strikes, etc. The behavior of market participants can also be an important factor for stock prices. Macroeconomic variables are the factors which may have influence on corporate performance in products, services, and financial markets (currencies, interest rates, and consumer/ producer prices). Possible enterprise response to changes in external factors and their main effects should be measured by sensitivity coefficients (the change in a company's profit as a result of a change in each and every one of the most important macroeconomic variables) (Oxelheim, 2003).

Enterprise vulnerability to changes in the macroeconomic environment can be expressed in terms of three sensitivity measurements including exchange rates, interest rates, and inflation rates (Oxelheim, 2003). Oxelheim (2003) suggests determination of the influencing variables for each category and a set of sensitivity coefficients within a multivariate framework for every company.

Oxelheim (2003) states that MUST (macroeconomic uncertainty strategy) analysis is one of the frameworks that enable a company to estimate sensitivity coefficients by finding (1) company specific macroeconomic variables, (2) performance outcomes of variance in these variables, and (3) a suitable strategy to control these variables. He reports that the first step in MUST analysis is the fundamental analysis of variables which have potential explanatory value. So, he recommends the selection of broad and complete relevant variables for a strong conclusion then the identification of most important macroeconomic variables from the potential variables by employing multivariate analyses and finally reducing the number of explanatory variables through stepwise regression with a backward elimination procedure until a satisfactorily large part of the variation is explained (Oxelheim, 2003).

The interaction between macroeconomic variables and the stock returns

According to Fama (1981), economic activity measures such as industrial production and inflation are influential in the analysis of stock market activity. **Inflation** is considered as an influencing factor of the movement of stock prices. The rise in inflation may cause tight monetary policies, which in turn increases the discount rate, therefore, the cost of borrowing and finally investment reduction in the stock market. Asprem (1989) assumes that inflation is positively related to stock return if stocks provide a hedge against inflation. On the other hand, Barrows and Naka (1994), Chen et al. (1986) and Chen et al. (2005) empirically identify the negative effect of inflation on the stock market. Normally, it is expected that inflation rate causes to restrictive monetary policies which in turn negatively influences stock prices.

Unexpected inflation can directly influence the stock market index negatively through unexpected changes in the price level. Malkiel (1982) observes a negative relationship between inflation rate and stock market prices because of two reasons: (1) inflation rate is directly related with interest rate and therefore negatively related to equity prices, (2) inflation rate may have a negative effect on profit margins for special groups of companies such as public utilities, leading to a decrease in their stock prices.

In their study, Chen et al. (1986) report industrial production, changes in the risk premium, twists in the yield curve, and inflation as the most significant variables to explain expected stock returns. There are several other factors to be included such as exchange rates, commodity prices, short term interest rates, and the difference between long term and short term interest rates.

Omran and Pointon (2001) and Boyd, Levine and Smith (2001) discover a negative correlation between inflation and market activity and liquidity, and between inflation rate and both stock market return and prices. Additionally, Apergis and Eleftheriou (2002) find that inflation has negative influence on stock prices in a high inflationary pressure economy in Greece. Du (2006) observes a positive correlation between stock market returns and inflation in the 1930s because of strong pro-cyclical monetary policy and strong negative relationship of stock returns and inflation between 1952 and 1974 because of shocks during this period.

Exchange rates are another variable of interest in the determination of stock value. It is observed from the literature that the effects of exchange rates are increasingly searched. While considering exchange rate fluctuations, the focus is on the conversion of assets, liabilities, and international cash flows (Oxelheim, 2003).

Oxelheim (2003) reports that shareholders and financial analysts do not prefer using corporate supply of relevant information related to macroeconomic fluctuations. Therefore, he searches and identifies the correlation between exchange rate and the other macroeconomic variables. Therefore, he suggests the consideration of this information while measuring and dealing with exchange rate exposure.

There are two main considerations about **interest rate** fluctuations in accounting literature including the consideration of the debt (mainly foreign debt translation) and evaluation of financial instruments (Oxelheim, 2003).

By considering exchange rate channel of monetary policy transmission, local currency changes may drop the prices of export products and increase foreign demand and sales for exporting firms (Pan et al., 2007). Pan et al.'s (2007) 'exchange rate channel' is consistent with Dornbusch and Fisher's (1980) 'flow oriented' exchange rate model which asserts that exchange rate movements initially influence the international competitiveness and trade position, then the real output of the country, and finally the current and future cash flows of the company. As a result, both exchange rate channel and flow oriented models state that local currency negatively influences the firm value of exporting firms, and vice versa for the importing firms (Oxelheim, 2003).

The firms which are not directly involved in the export/import business are also influenced by exchange rate movements if their input prices, output prices, or product demand are related to exchange rate (Adler and Dumas, 1984). The literature about the relationship between stock markets and exchange rate gives mixed results. Aggarwal (1981) finds positive effects and Soenen and Hennigar (1988) identify negative influence of exchange rates on the stock market. Ibrahim (2000) employs three different exchange rate measures including real effective exchange rate, nominal effective exchange rate and RM/US\$ (home currency/dollar). However, he can not find long run relationship between stock market and exchange rates in a bi-variate setting in Malaysia. But after including money supply and reserves, he observes some evidence of the long run relationship among the four variables (stock market index, exchange rate, money supply and reserves). He furthermore identifies that money supply and reserves influence the stock market index in the short run.

According to Maysami and Koh (2000), when the effects of inflation and interest rate on stock price are considered, an increase in expected inflation rate may cause to tightening policies which can negatively influence stock prices.

Additionally, the **Cash Flow Valuation Model** suggests that inflation rate positively influences the nominal risk free rate and the discount rate. According to DeFina (1991), cash flows don't increase as inflation does and discount rate negatively affects stock prices.

Kim (2003) identifies that the S&P 500 stock price is positively correlated with industrial production but negatively related with the real exchange rate, interest rate, and inflation. Ewing and Thompson (2007) observe the cyclical correlation among industrial production, consumer prices, unemployment, and stock prices by employing time series filtering methods.

Oxelheim (2003) considers the macroeconomic environment, by considering Oxelheim and Wihlborg (1987), as exchange rates, interest rates, inflation rates, and political risk premiums.

Mukherjee and Naka (1995) assert that both short-term and long-term interest rates may positively influence discount rates through their effect on nominal risk-free rates. Furthermore, according to them, restrictive policies by higher interest rates or discount rates can decrease cash flows value and therefore reduce the attractiveness of investment and minimizes the value of stock returns. By considering substitution effect, they continue that the rate of interest increases the opportunity cost of holding cash and causes to a substitution effect between stocks and other interest bearing securities like bonds. Treasury bill rates and interbank rates are commonly used interest rate proxies (Mukherjee and Naka, 1995; Maysami and Koh, 2000; Hooker, 2004).

Schwert (1989), Koutoulas and Kryzanowski (1996), and Maysami and Koh (2000) observe that macroeconomic variables can explain the developed U.S., Singapore, and Canada stock market movements. However, for the developing economies their influences present mixed results.

Research Methodology

The Data

Since Istanbul stock exchange market is a relatively young market compared to the other developed markets, large amount of data cannot be achieved about the companies. This study selects 48 companies in 11 different sectors (electric, food, communication, paper, chemistry, metal-main, metal-product, stone, textile, commerce and transportation) of Istanbul Stock Exchange. The companies are selected according to FORTUNE 500 list for Turkey. The companies are selected by considering their data availability, profitability and performance in Istanbul Stock Exchange Market and they are considered as the representatives of their sectors. The data spans from the second month of 2005 to the second month of 2012 including 85 monthly observations.

This research prefers interbank interest rates as the proxy for interest rate. For exchange rates, dollar rates are considered. For inflation, consumer price index is chosen as the proxy. Moreover, Current account deficit represents the difference between import and export values. This study also uses unemployment rates and sector indices among domestic macroeconomic factors.

Autoregressive Distributed Lag (ARDL)

This research employs the autoregressive distributed lag (ARDL) approach in order to identify the relationships between stock returns and selected domestic macroeconomic variables. The ARDL method can provide the robust long-run results while working on small sample sizes and it can be applied if the primary variables are entirely I (1) or I (0) or mutually integrated.

The formula of the first ARDL analysis for identifying the relationship between the stock returns and domestic macroeconomic variables is given as follows:

$$\begin{split} \Delta Ln(SR)_t &= \Psi_0 \\ &+ \sum_{i=1}^n \Psi_i \Delta Ln(SR)_{t-i} + \sum_{i=1}^n \Psi_i \Delta Ln(InfR)_{t-i} + \sum_{i=1}^n \Psi_i \Delta Ln(ER)_{t-i} + \sum_{i=1}^n \Psi_i \Delta Ln(IntR)_{t-i} \\ &+ \sum_{i=1}^n \Psi_i \Delta Ln(UR)_{t-i} + \sum_{i=1}^n \Psi_i \Delta Ln(CAD)_{t-i} + \sum_{i=1}^n \Psi_i \Delta Ln(SI)_{t-i} + \alpha_1 \Delta Ln(SR)_{t-1} \\ &+ \alpha_2 \Delta Ln(InfR)_{t-1} + \alpha_3 \Delta Ln(ER)_{t-1} + \alpha_3 \Delta Ln(IntR)_{t-1} + \alpha_4 \Delta Ln(UR)_{t-1} \\ &+ \alpha_5 \Delta Ln(CAD)_{t-1} + \alpha_6 \Delta Ln(SI)_{t-1} + \zeta_{t-1} \end{split} \label{eq:delta_ln}$$

Where SR, InfR, ER, IntR, UR, CAD and SI denote stock returns, inflation rate, exchange rate, interest rate, unemployment rate, current account deficit and sector index respectively.

Before employing ARDL method, all macroeconomic data has been tested for unit root in order to identify whether the data are stationary through level and 1st difference Akaike-Information Criterion and it is observed that the data consist of both stationary and non-stationary information. According to the results, the data are found to be proper for ARDL approach. Therefore, ARDL is applied through four lags.

Empirical Results

In this section, the effects of domestic macroeconomic factors on the stock returns are presented with respect to their sectors. Below considerations are extracted from Table 1.

For **Electric Sector**, sector index is found to be significant for all companies. Then, except for one company exchange rate is observed to be significant. Unemployment rate, current account deficit and consumer price index are influential on some of the companies. But no significant effect of interest rate is observed.

Exchange rate is significant on almost all stock returns in **Food Sector**. Moreover, sector index, current account deficit and consumer price index are identified to have impact on stock returns. Unemployment rate and interest rate have influence on only one company in **Food Sector**.

Consumer price index, interest rate and sector index are measured to be effective through **Communication Sector**. The other factors do not have significant effect on the sector.

According to the results, **Paper Sector** is influenced mainly by exchange rate and sector index. However unemployment rate and current account deficit have impact on some of the companies within the sector. The remaining factors do not have much influence on this sector.

For **Chemistry Sector**, the relationship between stock returns and sector index is found to be significant while the other factors are significant for few companies.

Exchange rate and sector index are the main influencing factors in **Metal-Main Sector**. After that current account deficit and interest are detected to have effect on some of the companies. On the other hand, unemployment rate and consumer price index seem not to have influence on the sector.

In **Metal-Product Sector**, wide influence of sector index is apparent. It is followed by consumer price index. The other factors are not very much influential on the company stocks.

Exchange rate is significantly associated with almost all companies through **Stone Sector**. Unemployment rate follows exchange rate as the second most influencing factor. But, the remaining factors have few relationships with the stock returns in **Stone Sector**.

About **Textile Sector**, it can be reported that sector index is clearly observed to be significant for all companies within the sector. The influence of interest rate is also significant on some of the companies. On the other hand, exchange rate has no significant relationship with the stock returns. The other factors do not have significant impact as sector index and interest rate.

In **Commerce Sector**, both exchange rate and sector index are found to be effective through the sector companies. All the other factors are also identified to have relationships with varying number of companies.

Finally, **Transportation Sector** is found to be effected by both interest rate and sector index. The remaining factors are effective on various stock returns through the sector.

TABLE 1: The Results for Domestic Macroeconomic Factors

Sector	Company	Unemployment Rate	Current Account Deficit	Consumer Price Index	Interest Rate	Exchange Rate	Sector Index
	Akenr	Significant					Significant
Electric	Aksue	Significant				Significant	Significant
Electric	Ayen		Significant	Significant		Significant	Significant
	Zoren					Significant	Significant
	Aefes						Significant
	Banvt		Significant			Significant	
Food	Skplc		Significant	Significant		Significant	Significant
	Tatks	Significant	Significant	Significant	Significant	Significant	
	Ulker			Significant		Significant	Significant
Communication	Tcell			Significant	Significant		Significant
	Hurgz	Significant	Significant		Significant	Significant	Significant
	Ipeke	Significant				Significant	Significant
Paper	Kartn					Significant	Significant
	Kozaa		Significant			Significant	Significant
	Tire	Significant	Significant	Significant		Significant	
	Aksa		Significant	Significant	Significant	Significant	Significant
Chemistry	Aygaz						Significant
	Petkm						Significant

	Trcas						Significant
	Tuprs	Significant	Significant	Significant	Significant	Significant	Significant
Metal-Main	Brsan					Significant	
	Cemts		Significant			Significant	Significant
	Eregl	Significant	Significant	Significant	Significant	Significant	Significant
	Izmdc				Significant		Significant
	Krdmd		Significant			Significant	Significant
Metal-Product	Arclk		Significant			Significant	Significant
	Toaso	Significant		Significant			Significant
	Ttrak	Significant		Significant			Significant
	Vestl		Significant	Significant	Significant		Significant
Stone	Adana					Significant	
	Afyon	Significant		Significant		Significant	
	Anacm			Significant		Significant	Significant
	Golts		Significant				
	Konya	Significant			Significant	Significant	
	Trkcm	Significant	Significant			Significant	
Textile	Altın			Significant	Significant		Significant
	Bossa	Significant	Significant	Significant	Significant		Significant
	Mndrs				Significant		Significant
	Sktas						Significant
	Yunsa						Significant
Commerce	Boynr	Significant	Significant		Significant	Significant	Significant
	Doas	Significant	Significant	Significant	Significant	Significant	Significant
	Kipa	Significant		Significant	Significant	Significant	Significant
	Mgros		Significant			Significant	Significant
	Sanko		Significant			Significant	Significant
Transportation	Clebi				Significant		Significant
	Thyao	Significant	Significant	Significant	Significant	Significant	Significant
	Ucak	Significant			Significant		Significant

Note: The significance level is 0.05

As a summary, the influence of sector indexes is clear on the stock returns except **Stone Sector**. Beside this, the wide influence of exchange rate on the stock returns is also identified, while it has not influence on the companies in Communication and Textile Sectors. Moreover it can be stated that interest rate has influence on Communication and Transportation Sectors. The other factors have significant impacts on the stock returns with varying numbers.

Conclusion

This study analyzes the impact of macroeconomic variables on the stock returns of 48 companies from 11 sectors. Sector level analysis is good in that they can present implications for both investors and policy makers. The results for the evaluated sectors provide different information for the same factors. Therefore, it may be useful in order to get well diversified portfolios.

Sector Indices are found to be quite influential through the selected sectors. The companies are mainly influenced by their industry sector indices.

Exchanges rate is also significantly influential on almost all the sectors except Communication and Textile sectors. The result for Textile Sector is found to be surprising. Because the companies in Textile Industry frequently use global currencies in their transactions, this relationship is expected to be significant.

The literature presents mixed results about the remaining macroeconomic factors. In line with the expectations, the impacts of **Interest Rate**, **Inflation Rate**, **Current Account Deficit**, **and Unemployment Rate** are various through the selected sectors.

The influence of Istanbul Stock Exchange Market on the stock returns of considered companies is significantly clear through the sectors except six companies (two companies from Paper sector, one company from Metal-Main sector, two companies from Stone sector and one company from Textile sector) out of 48 companies.

References:

Adler, M. and Dumas, B. (1984). Exposure to Currency Risk: Definition and Measurement. Financial Management, 13: 41-50.

Aggarwal, R. (1981). Exchange Rates and Stock Prices: A Study of the U.S. Capital Markets under Floating Exchange Rates. Akron Business Economic Review, 12, 7-12.

Apergis, N., & Eleftheriou, S. (2002). Interest rates, inflation, and stock prices: the case of the Athens Stock Exchange. Journal of Policy Modeling, 24(3), 231-236.

Asprem, M. (1989). Stock Prices, Asset Portfolios and Macroeconomic Variables in Ten European Countries. Journal of Banking and Finance, 13, 589-612.

Barrows, C.W. and Naka, A. (1994). Use of Macroeconomic Variables to Evaluate Selected Hospitality Stock Returns in the U.S. International Journal of Hospitality Management, 13, 119-128.

Binswanger, M. (2000). Stock market booms and real economic activity: is this time different? International Review of Economics and Finance, 9, 387–415.

Black, F. (1972). Capital Market Equilibrium with Restricted Borrowing. The Journal of Business, 45(3), 444–455.

Boyd, J. H., Levine, R. and Smith. (2001). The impact of inflation on financial sector performance. Journal of Monetary Economics, 47(2), 221-248.

Brennan, M. J. (1971). Capital Market Equilibrium with Divergent Borrowing and Lending Rates. The Journal of Financial and Quantitative Analysis, 6(5), 1197–1205.

Chen, M.H., Kim, W.G. and Kim, H.J. (2005). Macro and Non-Macro Explanatory Factors of Chinese Hotel Stock Returns. International Journal of Hospitality Management, 24, 243-258.

Chen, N., Roll, R., and Ross, S. A. (1986). Economic forces and the stock market. Journal of Business, 59 (3): 383-403

Cochrane, J. H. (2008). The Dog That Did Not Bark: A Defense of Return Predictability. Review of Financial Studies, 21:1533–75.

Defina, R.H. (1991). Does Inflation Depress the Stock Market?. Business Review, 3-12.

Du, D. (2006). Monetary policy, stock returns and inflation. Journal of Economics and Business, 58(1), 36-54.

Errunza, V. and Hogan, K. (1998). Macroeconomic determinants of European stock market volatility. European Financial Management, 4, 361–377.

- Ewing, B.T. and Thompson, M.A. (2007). Dynamic cyclical comovements of oil crices with industrial production, consumer prices, unemployment, and stock prices. Energy Policy, 35, 5535–5540.
- Fama, E. F. (1990). Stock returns, expected returns, and real activitiy. Journal of Finance 45, 1089-1108.
- Fama, E. F. (1981). Stock returns, real activity, inflation, and money. American Economic Review, 71, 545–65.
- Hamilton, J.D. and Lin, G. (1996). Hamilton and Lin, Stock market volatility and the business cycle. Journal of Applied Econometrics, 11, 573–593.
- Hooker M. A. (2004). Macroeconomic Factors and Emerging Market Equity Returns: a Bayesian Model Selecting Approach. Emerging Markets Review, 5, 379-387.
- Huberman, G. (1982). A simple approach to arbitrage pricing theory. Journal of Economic Theory, 28(1), 183–191.
- Ibrahim, M.H. (2000). Co-integration and Granger Causality Tests of Stock Price and Exchange Rate Interactions in Malaysia. ASEAN Economic Bulletin, 17(1), 36-47.
- Kim, K. H. (2003). Dollar exchange rate and stock price: evidence from multivariate cointegration and error correction model, Review of Financial Economics, 12 (3), 301-313.
- Koutoulas, G. and Kryzanowski, L. (1996). Macro-factor Conditional Volatilities, Time-Varying Risk Premia and Stock Return Behavior. Financial Review, 31(1), 169-195.
- Lewellen, J. (2004). Predicting returns with financial ratios. Journal of Financial Economics, 74 (2), 209–235.
- Lintner, J. (1965). The valuation of risk assets and the selection of risky investments in stock portfolios and capital budgets. The Review of Economics and Statistics, 47, 13–39.
- Malkiel, B. G. (1982). Risk and return: A new look, National Bureau of Economic Research Cambridge, Mass., USA.
 - Markowitz, H. (1952). Portfolio selection. Journal of Finance, 7(1): 77-91.
- Maysami, R. and Koh, T.S. (2000). A Vector Error Correction Model of Singapore Stock Market. International Review of Economy and Finance, 9, 79-96.
- Mukherjee, T.K. and Naka, A. (1995). Dynamic Relations between Macroeconomic Variables and the Japanese Stock Market: An application of a vector error-correction model. Journal of Financial Research, 18(2), 223-237.
- Omran, M.and Pointon, J. (2001). Does the inflation rate affect the performance of the stock market? The case of Egypt. Emerging Markets Review, 2(3), 263-279.
 - Opfer, H. and Bessler, W. (2004). University of Giessen. FMA's E-journal, June 2004.
- Oxelheim, L. (2003). Macroeconomic Variables and Corporate Performance. Financial Analysts Journal, 59(4), 36-50.
- Oxelheim, L., and C. Wihlborg. (1987). Macroeconomic Uncertainty-International Risks and Opportunities for the Corporation. New York: John Wiley & Sons.

- Pan, M-S., Fok, R. C-W, Liu, Y. and Angela (2007). Dynamic Linkages between Exchange Rates and Stock Prices: Evidence from East Asian Markets. International Review of Economy and Finance, 16, 503-520.
- Roll, R. (1977). A Critique of the Asset Pricing Theory's Tests Part I: On Past and Potential Testability of the Theory. Journal of Financial Economics, 4.
- Ross, S. A. (1976). The Arbitrage Theory of Capital Asset Pricing. Journal of Economic Theory, 13(3), 341–360.
- Schwert, G.W. (1989). Why does stock market volatility change over time? Journal of Finance, 44(5), 1115-1153.
- Sharpe, W. F. (1964). Capital Asset Prices: A Theory of Market Equilibrium under Conditions of Risk. Journal of Finance, 19(3), 277–293.
- Soenen, L. and Hennigar, E. (1988). An Analysis of Exchange Rates and Stock Prices: The US Experience (1980-1986). Akron Business and Economic Review, 19(4), 7-16.