

CONTROVERSIES IN ACCEPTANCE OF GENETICALLY MODIFIED FOOD BY EUROPEAN
UNION: SYMPTOMS OF CONFLICTS IN DIFFUSION OF AN INNOVATION

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and hereby certify that, in their opinion, it is worthy of acceptance.

Professor Glen T. Cameron

Professor David Sleper

Professor Fritz Cropp

Professor Maria Len-Rios

Love you Pa, Ma and Jaya; thanks for everything.

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Controversies in Acceptance of Genetically Modified Food in European Union: Symptoms of Conflicts in Diffusion of an Innovation
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ABSTRACT

The thesis is an attempt to merge diffusion of innovations with contingency theory, and examine controversy on gene modification in European Union with the combined model. According to the combined theoretical model: the components/requirements of an innovation may come in conflict with adopter's settings, and the adopter takes a stance, which moves on a continuum depending upon internal and external variables. Application of gene modification technology in food is one such innovation. Over the years it has become one of the most controversial issues in European Union. On the one hand it is perceived as having far-reaching implication in the field of agriculture and rural development; while on the other, it is objected on health, ethical and environmental grounds. The study examined EU's legislation and newspaper reports through qualitative method, to observe its stance. The findings verified that EU's stance moved over time and it was dependent on various internal and external variables; thus sustaining the combined model. Besides, the findings also revealed that the significance of variables increased and decreased with time, and they interacted with each other, which in turn had an affect on EU's stances.

INTRODUCTION

A quest for newness is perhaps a natural tendency present among most of us. A new idea or a new way of doing things or an idea to modify the existing idea keeps on popping within us almost every day. Some ideas get limited to our own use, while some get accepted and used by our surrounding, while still others play a significant role in the advancement of civilizations; innovation of a “wheel” was one such great idea.

The adoption of an idea/practice or a technology has been studied exhaustively with the theory of “diffusion of innovations (Rogers, 2003).” The theory considers “innovations” as ideas or technologies that are *perceived* as new. According to the theory, “diffusion (of innovations) is a process by which (1) an innovation (2) is communicated through certain channels (3) over time (4) among the members of a social system (p.11).”

If we examine “innovations” more closely, we find that they seldom remain in their pure form forever; they get modified according to the need of the users. Probably the original concept of the wheel was to use it for transportation but then it got modified, and along with the original use, it also started being used to make pots for storing food and for drawing water from wells. In modern times, wheels are an intrinsic part of most machines.

Not only the technologies but concepts and ideas also get modified to suit the needs of the local environment. For instance, the ideology of communism, which was initially conceived by Karl Marx got modified by Lenin and implemented in Russia, then

again got modified by Mao Zedong in China and then in other countries. Currently China has further modified the ideology to suit the needs of the country, while in other countries this ideology is being practiced in accordance with the socio-economic and political settings. Another example is the concept of “laissez faire” economy, which is practiced in a different way by different countries. Likewise the list of significant innovative concepts and technologies, and their modifications both at micro or macro level, seems to be almost endless.

The complexities in the diffusion process however, do not end with the modification of innovations; sometimes innovations are partially accepted under certain conditions, and the adopter’s stance toward it keeps on changing in a given span of time. Common examples of the partially accepted innovations could be the use of “internet”, “Face-book” or “E-mails” or for that matter, software like “Microsoft Word,” or “Photoshop.”

To get a clearer picture we can take the example of Facebook. Facebook is a kind of electronic social media that connects people through its various applications such as uploading images, videos, texts on wall, sending messages, etc. Perhaps the adoption of this innovation would be complete if the consumer started using all the applications provided on the Facebook.

Use of gene modification technology in food is another example. The technology became popular in early 90s and currently seems to have become one of the most controversial subjects of the present times (World Health Organization, 2010). With this technology, scientists can manipulate genes of any organism to change its traits, which

has far-reaching implications in the field of agriculture and rural development; as now crops can be grown with almost no water, or they can inherently be made pest resistant, or they can have additional qualities helpful to improve human health.

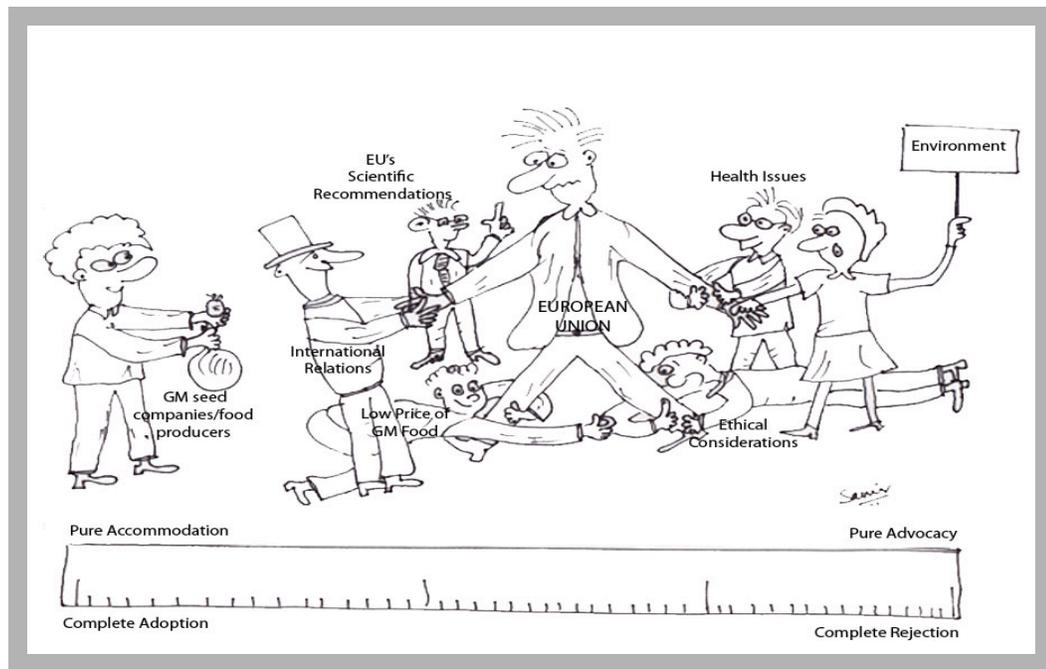
Gene modification technology however, has a flip side too. It can trigger an uncontrolled modification of genes that can literally change the face of the earth. Moreover, it is still unknown how genetically modified plants will affect human beings in the long run. These controversies along with several others have made many countries and institutes take different stances toward adopting the technology, which changes with time, and which is reflected in country's legislation, public opinion and through the media.

Diffusion of innovation is an ever-growing theory and several attempts have been made to understand the complexities by introducing newer approaches, such as by hybridizing it with "complex adaptive systems (Rogers, Medina, Rivera & Wiley, 2005)." As a novel approach, an attempt has been made in the following study to examine the complexities in diffusion of gene modification technology through conflict management's perspective.

Contingency theory is one of the widely used conflict management theories in research and practice. The theory states that in a given conflict an organization/entity takes a stance, which is dynamic, moves on a continuum between complete acceptance and rejection, and depends upon a set of internal and external variables (Cancel, Cameron, Sallot & Mitrook, 1997).

A closer look at the social systems in some of the diffusion process reveals distinct conflicts in the form of beliefs, everyday practices, and infrastructure of the adopters; with the components/requirements of the innovation. Contingency theory can be helpful in determining the degree of acceptance of any innovation and also in identifying and categorizing the variables affecting it. By examining diffusion of gene modification technology through contingency model, the following study attempts to provide valuable insights in the complexities of diffusion process and anticipates having a far-reaching implication in academia and rural development.

Figure 1. Thesis-Sketch



Sketch by: Samir Prasad

LITERATURE REVIEW

Key Technical Terms

Genetics is a scientific subject and research scholars from other schools use a few terms in genetics, interchangeably. An explication of such terms would be helpful in understanding the variety of literature on the subject. “Biotechnology,” a term that is frequently used in media is actually a very general term and can be defined as “deciphering and use of biological knowledge.” “Modern biotechnology” however, is a more specific term that means bringing about desired changes in the molecules and cells of organisms through the use of modern biological science (Smith, 2004, p. xi).

The terms “Genetic engineering” and “gene modification” are often used interchangeably in research studies and news reports however, both are different concepts. Gene modification can be brought about by conventional methods that do not involve genetic engineering at all, such as by cross breeding that has been practiced by farmers since hundreds of years. Genetic engineering is the modern scientific process of gene transfer in order to bring about a desired change in a living organism (Chrispeels & Sadava, 2003).

The current controversy is in fact on “genetic engineering” however, the terms “gene modification” and “biotechnology” are used more often in its place.

Literature on Gene Controversy

A gene is made up of double helical structure called DNA, and the DNA molecules are packed just like threads called chromosomes inside our cells. Genes

provide instructions for building all the internal and external characteristics of any living being (National Institute of Health, 2010). For thousands of years human beings have been

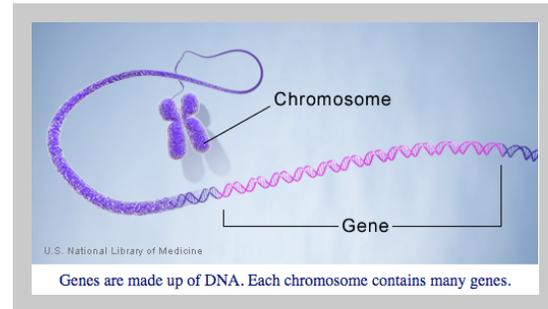
knowingly/unknowingly modifying genes in crops by cross breeding or transplanting them.

Mendel's law of inheritance greatly helped in improving the quality of crops during the early 20th century, however scientists were still unaware of the fundamental questions of inheritance; such as what are "genes," what are they made of, and how they provide instructions to the body?

It was a few decades later that Watson and Crick, with the combined efforts of several scientists, constructed the model of DNA. In a landmark article in "Nature" published in 1953, they declared, "we wish to put forward a radically different structure for the salt of deoxyribose nucleic acid (DNA), the structure has two helical chains each coiled around the same axis (p. 737)." Watson and Crick also proposed the mechanism through which DNA (genes are made up of DNA) replicates, and their groundbreaking discoveries led them to the Nobel Prize in 1962.

As the possibilities for gene manipulation in plants and animals increased, a debate on the use of gene modification started in the scientific community itself. In a paper published in the "Genetics", Frankel (1974) expressed his concerns in using genetic engineering in plants, animals and microbes. According to the author, the

Figure 2. Genes



Source: National Institute of Health, USA
<http://ghr.nlm.nih.gov/handbook/basics/gene>

impact of genetics dates back to the origin of agriculture itself. However, the “time scale of concern” during that period was too short (p. 53). This was because the potential for gene modification was miniscule compared to the vast potential of gene manipulation with present technologies. According to the author, the uncontrolled use of genetic technologies would incredibly increase the depletion of naturally occurring resource of genes present in living beings. One way to limit use of gene modification could be by practicing “evolutionary ethics as a part of social ethics” by human beings (p. 54).

Though precautions and warnings continued to appear in the science journals, they did not in any way affect the fast progress made in the field of genetic engineering. Scientists earnestly kept on critically examining the usefulness of this technology and at the same time pointing out the need for more experiments and publications in the field of agro-based genetic engineering (Klienhofs & Behki, 1977).

With the introduction of genetically modified foods and drugs in the market, such as (a) Insulin, (b) genetically engineered BST (Bovine Somatotropin) which is used to enhance milk production in cows in early 90s and, (c) genetically modified “Flavr Savr” tomato in 1994; the controversies on the implications of genetic engineering started to intensify and also diversify in the scholarly literature. Scholars in the 80s and early 90s started raising issues related to consumer perception, economic development and government policies, along with the environmental and ethical issues associated with this technology. In 1988 a study on the agricultural policies was presented in the sixteenth UN- Food and Agriculture Organization’s regional conference for Europe, which was two years later published in the form of a book (Alexandratos, 1990).

According to the report, genetic engineering is very useful for agricultural growth in Europe however, it also raises issues such as (a) increase in disparity among farmers (b) rise in unemployment; as the production increases with less labor and, (c) raises safety concerns among consumers. Policy makers need to demystify the concept of genetic engineering among consumers and include clauses in their directive for mitigating risks associated with it.

In 1990, the European Union passed a directive regulating the use of genetically modified organism by the member countries. Szczepanik (1993) appreciated the EU's directive by highlighting the social and environmental concerns mentioned in it. According to the author, even though EU's directives undermine the commercialization of the biotech industry, it would help in generating more research and experiments that would incorporate both environmental and social concerns.

Scholars such as Juma (1989) highlighted the significance of patent rights in the use of genetically modified crops. According to the author, patenting would adversely affect food producers of underdeveloped countries like Africa, as small farmers would be compelled to use genetically modified seeds produced by the big companies. The author highlighted the urgency to develop government policies in consultation with the common people in the underdeveloped countries. Taking a diametrically opposite view, Morse (1996) in the paper– “Biotechnology - a servant of development” highlighted the benefits of gene modification to small farmers in developing countries. With this technology the farmers could now choose the crops according to the climatic

conditions. According to the author, the replication and distribution of such crops and seeds could be done through non-profit organizations.

Scholars during the 1990s also raised concerns over environmental legislations. Rogers (1990) highlighted the shortcomings in the environmental legislation of the United States of America. According to the author, genetically modified crops pose unique risks. Once genetically modified seeds are sown, they cannot be recalled and permanently affect the environment. The author strongly suggested that the existing environmental statutes do not adequately address such unique problems and new legislations would be required.

Public protests against genetically modified crops first emerged in Europe; starting in Switzerland during early 1990s, and later spreading to other European countries (Weasels, 2009). In 1998, owing to the widespread protests, the European Union stopped approving new genetically modified crops and five member countries followed the moratorium. It is highly probable that the rise in public protests, increased coverage in mass media, and the formulation of policy regulations in Europe, increased the scholarly literature focusing on Europe and its people regarding genetically modified crops in the late 90s and early 21st century.

Levidow, Carr, and Wield (2000) coming closest to the topic of the proposed thesis, examined how the oppositions over genetically modified crops influenced the policies of member states and of the EU. The authors examined the policy directives of ten selected countries and the EU, between 1997 and 1999 and found that the burden of evidence for safety was increased on the producers, the definition of “adverse

effects” was broadened, and mandatory labeling of the genetically modified products was initiated; all of which indicated that EU directives became harsh during this particular period.

Rowland (2002), a scholar from the field of medical science, examined links between science, media and the common people in the context of gene modification. Highlighting the controversial benefits and risks of genetically modified food, the author pointed out how negative media publicity has adversely affected the marketing of genetically modified products in Europe. According to the author, if media were provided with positive information regarding genetically modified food, it would help in building positive consumer attitudes toward new technology through its reports.

“GM Nation?” was one of the first large scale public debates, held in the United Kingdom in 2003. The main objective of the debate was to know the public perception on genetically modified crops and food. The debate was organized at three levels: (a) national and regional, (b) county level and (c) the local level. Augoustinos, Crabb and Shepherd (2010) analyzed the role of media in the “GM Nation?” debate. By examining six newspapers of the United Kingdom in the first three months of 2004, the authors concluded that the GM debate in the newspaper was represented as a “political battleground rather than a debate about science and technology (p. 112).” In a study on public perception, Brossard and Shanahan (2006) have attempted to examine the ways to develop communication strategies for the common people that could help in removing controversies and in building a common understanding of biotechnology based on science, ethics and practical applications.

The above literature is small portion of the numerous studies done on gene modification. An attempt was made to examine how scholars from various fields have analyzed the controversies on this issue. Some have examined it from scientific viewpoint, while others have examined it as a subject of policy regulation while still others have examined the consumer perception and the role of media on this issue.

Though the existing studies have looked at the controversies from various angles however, there seems to be a lack of theoretical analysis on how the controversies have affected the diffusion of this particular innovation. Have the controversies impeded the adoption of gene technology or have they increased the rate of it, or have they increased the overall understanding on this technology, or have the controversies made the adopters put conditions while adopting such innovations, and if they have, could the stance of the adopters be examined and does this stance change with time, and if it does, what are the factors that determine the stances? An attempt can be made to answer all these and other related questions by merging conflict management with the theory of diffusion of innovations and examining this issue.

Literature on Diffusion of Innovations

“Innovation” is a term that has been used for centuries. The popular dictionary meaning is “a new idea, method or a device (Merriam Webster Online, 2010).” Though various scholars in the past, like Schumpeter (1934) used the concept of innovations in their research studies, it was Everett M. Rogers who in 1962 developed this concept into one of the most popular theories of all time called the theory of “diffusion of innovations.” In this theory, Rogers considered innovation to be the perceived newness

of an idea; “if the idea seems new to the individual, it is an innovation (Rogers, 2003, p.12).” According to the author, diffusion (of innovations) “is a process by which (1) an innovation (2) is communicated through certain channels (3) over time (4) among the members of a social system (p.11).”

The author identified four basic elements of diffusion of innovations: (1) innovation - which means an idea or a practice for instance washing hands before eating or technologies such as genetic engineering, computer, internet, beside others, (2) channels – that constitute the interpersonal or mass mediated communication, (3) time period – which is the time taken by the adopters to adopt an innovation and (4) among the members of a social system – which is a group of members with a set of common beliefs, customs, practice and the goals that connect them. “The social system constitutes the boundary within which an innovation diffuses (p.24).” In the process of diffusion, members who adopt the innovation are called adopters. There are five ideal categories of adopters; the first ones are called innovators then there are the “early adopters,” “early majority,” “late majority” and the “laggards” (p.22). The “opinion leaders” and the “change agents” play an important role in the diffusion of innovation (p.26). Opinion leaders are members of social system who exert influence on the decision of adopters, while the change agents are those who purposely influence adopters toward accepting innovation.

Diffusion of innovations is a complex process. An innovation that works in one group or a society may not work in the other. And even if it works in other groups or societies, it may not be accepted fully because of various factors such as tradition,

religion, laws, environment, lifestyle and behavior of the people. Numerous research studies have been done on the diffusion theory. An estimated 5,200 studies had been published until 2003, which is growing at the rate of about 120 publications per year (p. xviii); however, one of the criticisms picked up by Rogers himself is the “stereotyped and limited ways” through which diffusion process have been examined (p. xviii). An attempt to examine the diffusion through conflict perspective may help in breaking that stereotype. Though few scholars have highlighted conflicting issues that occur in the process of diffusion of innovations, there is a lack of analysis of those issues by combining the two theories.

In 1981, Rogers and Kincaid made an attempt to examine the factors leading to diffusion of family planning methods in rural areas (Rogers, 1983, p. 25). They studied the behavior of two Korean women, who had the same educational and demographic background, but lived in two different villages. The authors found their behavior toward adopting the family planning method to be different. According to the authors, one of the reasons for this was different social structure in the villages. Perhaps, the extent of customs and beliefs that came in conflict with the innovation was less in one village compared to the other.

Winston (1998) in the book “Media Technology and Society: A History: from Telegraph to the Inter-net” hypothesized that it is not the technology that shapes the society rather it is the society that shapes any technology. The author further argued that societal forces such as beliefs and practices of a community determine the acceptance and even arrival of the new technologies.

In a more recent study, Mee, Katz, Alem and Kravis (2007) investigated the challenges in setting up a web based knowledge portal to help in improving water quality in Australia. According to this study, the change agents faced three basic challenges: (a) the motivation factors for adopting the technology was different among the villagers (b) the technical language of the change agents was different from the language of villagers (c) adoption of an unproven technology. Though not all but the first two of these challenges could also be seen as conflicts in the adoption process. In a similar study, Jinqi, Xiaoming & Banerjee (2006) studied the diffusion of Internet in rural areas of China' Gansu province. According to them adoption of the new technology was undermined because the infrastructure and the local economy of those areas came in conflict with the requirements of the new technology.

In the above literature the authors have highlighted the societal values, everyday practices, infrastructure, local economy, technical knowledge, and social self-identity, as variables that may come in conflict with the requirements of adopting innovations and affect the diffusion process. Examining these conflicts through the contingency theory would be perhaps another step in trying to understand the variables and the degree of acceptance of these innovations.

Literature on Contingency Theory

Prior to the contingency theory, much of the literature on public relations was based on Gruing's four models: (a) "Press agency", in which the public relations aim at publicity with whatever means possible, (b) "Public information model" in which they use journalists to disseminate favorable information to the public (c) "Two way

asymmetrical model” in which public relations uses feedback to develop messages in order to persuade the publics, (d) “Two way symmetrical model” or the excellent public relations model, in which public relations uses research and dialogue to manage conflict, develop understanding and build relations with the public. With the two way symmetrical model both, organization and public’s behavior may change (Gruing & White, p. 39).

In a landmark article in 1997, Cancel, Cameron, Sallot and Mitrook pointed out an intrinsic flaw in the four models. The models did not seem to be applicable in real world as the actions of public relations “depended upon a number of factors ranging from antecedent conditions to current pressures and opportunities” that rarely fit with Gruing’s model (p. 33). The authors took the concept of ‘it depends” to postulate a more realistic, contingency theory, which in a nutshell argues that the stance of any organization lies on a continuum that ranges from complete acceptance to complete advocacy and over 80 variables determine the position of its stance. They divided the variables into external and internal and sub-grouped them as: External Variables such as - (a) Threats (b) Industry Environment (c) External Public (d) Issue Under Question; and Internal Variables as – (a) Corporation Characteristics (b) Public Relations Department Characteristics (c) Characteristics of Dominant Coalition (d) Internal Threats (e) Individual Characteristics (f) Relationship Characteristics.

In 1999 Cancel, Cameron and Mitrook tested the theory through interviews of public relations professionals and found it to be applicable in real situations. The authors also verified the factors that determine the stance of an organization in a given

situation and at a given point in time. They categorized the factors into two – “predisposing” and “situational variables” (p. 177). Some of the significant predisposing variables they found were (a) the visibility of the organization, (b) the corporate culture (c) enlightenment of dominant coalition, and the situational variables were (a) urgency in situation (b) balancing of interest (c) characteristic of public claims or requests. The authors also identified which of the variables were highly supportive and which ones were less supportive in real conflict situations.

Two years later, Cameron, Cropp and Reber (2001) also tested six proscriptive variables that may influence the organizations to take a stance of complete advocacy. The concept of “Public” is an intrinsic part of the contingency theory. Hallahan (2000) categorized it into four groups “active publics,” “aware publics,” “aroused publics” and “inactive publics” on the basis of knowledge and involvement (p. 504). The fifth group called the “non publics” which is a “default component in the model” does not have knowledge or involvement with an organization (p.505).

Over the years, contingency theory has been further tested and refined with numerous research studies. In 2003, Reber and Cameron conducted a quantitative test of the contingency theory through a survey of 91 top-level public relations practitioners. In 2006, as a next step toward testing the theory at national level, Shin, Cameron and Cropp conducted a nationwide survey of public relations professionals and verified the contingent variables.

In 2008, Cameron, Wilcox, Reber and Shin have further explicated and refined the contingency theory. Taking the original approach of “it depends,” they have further

simplified the two basic principles of contingency theory: (a) there are many factors that influence the stance of the organization and (b) the stance is dynamic and changes as the events unfold; and they have also updated and elaborated the variables (p. 40).

Merging contingency theory with diffusion of innovations is an attempt to extend and test the theory in a different setting.

Concepts of Contingency Theory, Diffusion of Innovations and Gene Controversy

The concepts of contingency theory and diffusion of innovations go well with the gene modification controversy and also with each other. The 'social system' in the gene modification controversy seems to comprise the whole world, while the 'adopters' could be identified as the international bodies, countries, regional unions, organizations, research institutes and companies.

Most of the adopters in this social system are bound by the common goal of betterment of humankind and protection of natural environment. Companies and countries that promote this technology resemble the "change agents," while international development organizations like the United Nations and European Union could be identified as adopters as well as "opinion leaders." Looking from the perspective of contingency theory one finds "publics" in the form of ethical and environmental groups such as Greenpeace and even the group of countries that pressurize EU to adopt this innovation; and "organizations" in the form of countries, international development agencies like UN (FAO), institutes, and regional unions like European Union that seems to have taken a range of stances in between complete rejection and acceptance.

In the following study an attempt is made to examine the stances of European Union through its legislation and other sources from the period 2001 – 2010. The year 2001 is considered important as EU broke its unofficial moratorium on GM food and came up with a new set of directives in that year.

In this study “European Union as an organization based in Brussels” and “European Union as a regional union of 27 countries” are considered to be the same. The differentiation is beyond the scope of this study.

Research Questions

RQ1: What were the stances of EU on GM Food between 2001-2010, as reflected through the public opinion?

RQ2: What were the stances of EU as reflected through the cultivation of GM crops?

RQ3: What were the stances of EU as reflected through the legislation?

RQ4: What were the stances of EU as reflected through the media?

The stance of EU may have been affected by several factors, such as by scientific experiments, opposition by environmental/ethical groups, pressure from international trade bodies, etc. An attempt has also been made to relate these factors with the set of variables listed in the contingency theory.

RQ5: What internal and external factors influenced the stances of EU?

METHODOLOGY

This study examined the role of conflicts in the process of diffusion of gene modification technology in food production. It tried to look into how conflicts affect the diffusion process; do the adopters take a stance? Could the stances be traced on a continuum, and could these conflicts be categorized into sets of external and internal variables as postulated by the contingency theory?

To examine these questions, 'case study' of the European Union was undertaken. Help was taken from the study of Pang, Cropp and Cameron (2006) who have applied a similar approach in examining the role of public relations in corporate crisis planning.

'Textual' analysis was used as a tool to conduct the case study. 'Text' is something from which we can derive meaning from; it can be in the form of a book, television show, film, advertisements or an object (Mackee, 2003). The following literal text were used as the sources:

- (a) Survey/study reports conducted by European Union
- (b) Legislation of European Union on genetically modified organisms
- (c) Newspapers: "The New York Times" and "The Times"

Surveys/Studies conducted by European Union

EU conducts a survey called "euro barometer" in member states every 3rd year, starting 1991. The survey is based on a representative sample of approximately 1000 respondents in each EU member state. Reportedly, EU did not conduct the survey in 2008 rather it did so in 2010 which also provides a comparison between different

member countries since 1996. Besides the surveys, agriculture based studies conducted on behalf of European Commission, and the EU supported website such as “GMO Compass,” were consulted.

EU Legislation

The official website of the European Union called “Europa” is a rich source for data collection. All the legislation are posted on the website. A comparative study of the legislation was done to reflect the harshness or leniency. Help was taken from the study of Lividow, Carr, and Wield (2000) who have analyzed European Union’s legislation by comparing the articles that were later amended or added in it.

Newspapers

To assess the stances of European Union as projected in media, two newspapers: “The New York Times” and “The Times” (published from the United Kingdom) were examined. The assessment was done by keeping two broad objectives in mind, (a) to see the position of EU at various time periods (b) to see various factors that influenced the position of EU. In order to see the positions of EU; (i) the hook/peg of the story, (ii) official statements as quoted in the story, and (iii) the editorial comments on directives and crops approved/rejected, were examined. The statements were contextualized to reflect the harshness or softness of the stance.

To get a clear picture of the stance in any particular year, a search for the stories was done separately for each year on the phrase “European Union and Genetically Modified Food.” The total number of articles per year averaged 9-10 in The New York Times, and about 7-8 in The Times. All stories in the 2001-2010 period were examined.

Table 1.

Number of news stories in “The New York Times” and “The Times”

| | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | Total |
|------------------|------|------|------|------|------|------|------|------|------|------|--------------|
| NY Times | 11 | 7 | 31 | 9 | 9 | 9 | 6 | 6 | 3 | 7 | 98 |
| The Times | 4 | 4 | 27 | 12 | 1 | 1 | 7 | 6 | 4 | 5 | 71 |

Continuum Scale

A provisional scale was constructed on the contingency model to examine the stance. The scale consisted of ‘complete acceptance’, ‘complete rejection’ at the two ends, and the relative position of the stance was determined by:

- Comparing the meaning of terms used in the legislation
- Clarity of the clauses and the definitions in the directives
- Approval of number and variety of genetically modified crops
- Increase/decrease in EU’s plantation area for genetically modified crops
- Statement given by the EU ministers and officials
- Editorial comments

The stance was put on a graph in which X-axis denoted the time in years while Y-axis denoted the scale, with zero being complete accommodation and infinite being complete acceptance. The coordinates on Y-axis were relative and if from the previous year the source like legislation or the news report was found harsh, one point was

decreased and vice versa. The overall movement of the line in the graph was taken as the stance of the European Union on the continuum.

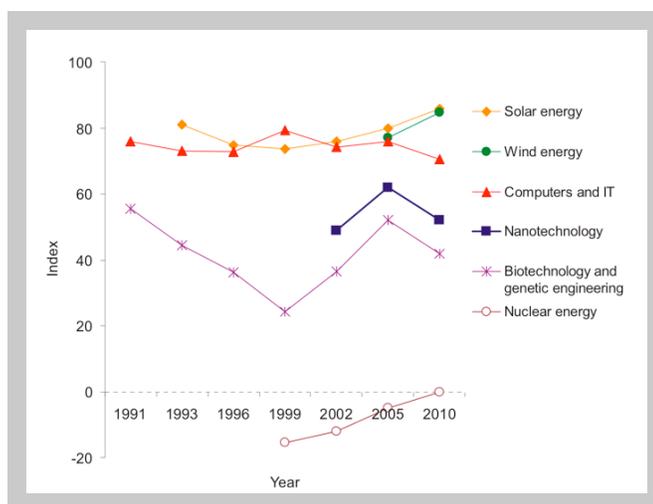
The fifth research question, which focused on the factors affecting the stances, was examined through the newspapers only. Here the categories as proposed in the contingency theory were taken into consideration to scrutinize the variables.

RESULTS

RQ1: What were the stances of EU on GM Food between 2001-2010, as reflected through the public opinion?

EU conducts a survey called “euro barometer” in member states every 3rd year, starting 1991. The survey is based on a representative sample of approximately 1000 respondents in each EU member state.

Graph 1. Optimism of EU’s General Public on different Technologies



Source: Europeans and Biotechnology in 2010 - Winds of Change, p. 18
(Published by European Commission)

Graph 1 shows the perception of general public in EU on different technologies. As indicated in the graph, the optimism on the use of biotechnology and genetic engineering in medicine, industry and food (taken together), shows a steady decline from 1990 until 1999; after that particular year there is a steep rise until 2005, after which there is a decline.

The public opinion specifically on GM food shows almost an even split between those who favor and those who oppose. In 1996, 61% of the respondents were supporters of GM food with or without risk. This figure declined to 48% in 1999. It rose to 50% in 2002 however it again fell to 42% in 2005.

Table 2. Public Opinion on GM Food

| | 1996 | 1999 | 2002 | 2005 |
|--|------|------|------|------|
| Respondents saying yes to GM food with/without risks | 61% | 49% | 50% | 42% |

Source: Eurobarometer-58, 2002 (p.16); Eurobarometer-60.4,2005

Reportedly, EU did not conduct the next survey in 2008 rather it did so in 2010.

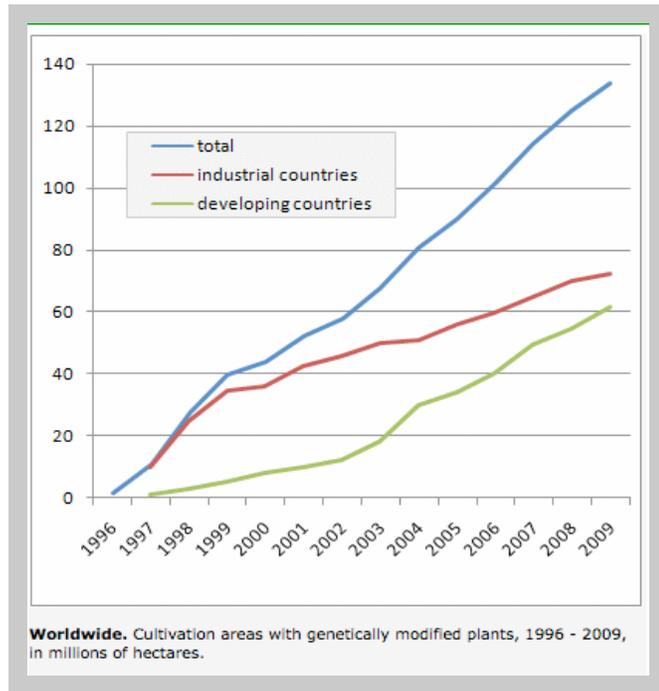
The survey report of 2010 compares the public opinion between 2005 and 2010, but uses a different scale. According to the report in 2005, 27% of people “totally agreed” or “tended to agree” with GM food, while in 2010 the figure declined to 23%.

Overall, the survey

reports from 1996-2010 show more or less an even split among those who favor and those who do not, however over the years there has been a marginal decline in the percentage of supporters.

RQ2: What were the stances of EU as reflected through the cultivation of GM crops?

Graph 2. Worldwide Cultivation of GM plants



Source: GMO Compass

A glimpse of EU’s stance on genetically modified food can also be obtained by looking at the kinds and areas of crops cultivated.

Currently five kinds of GM crops are commercially cultivated throughout the world: Soybean, Cotton, Maize, Rapeseed, and Sugar beet. The global area under cultivation of these crops has increased exponentially, as can be seen in the Graph 2.

In EU however, until 2010 only GM Maize was commercially grown and the area of growth was insignificant compared globally. The following data gives a glimpse of growth in the area of GM Maize in EU.

Table 3. GM Maize Cultivation in EU

| | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
|-------------------|------|------|------|------|------|------|------|------|------|------|------|------|
| Hectare (1000) | 22 | 25 | 26 | 11 | 21 | 32 | 58 | 54 | 62 | 110 | 107 | 94 |

Source: GMO Compass

The growth in the area shows a favorable stance toward the new technology. Initially it was only Spain, later countries such as Czech Republic, Portugal, Slovakia, Romania, and Poland have also started cultivating these crops.

RQ3: What were the stances of EU as reflected through the legislation?

EU passes directives and regulations primarily for (a) *imports* of genetically modified food, feed (animal food) and products for industrial use, and (b) for *field experiments* and commercial *cultivation* of GM crops inside EU.

The “directive” and “regulation” are parts of EU’s legislation. According to the EU’s Treaty of Rome, a *regulation* is binding in its entirety by the member countries, while the member countries can adjust a *directive* if they maintain the goal of it. Care has been taken to keep this difference while examining the stances.

EU's legislation target (a) the European Commission and the regional committees on GMOs, (b) the member countries and their committees on GMOs (c) the companies or institutes who want to experiment/produce/export/import or use the GM food/feed or other products.

The directives and regulations are divided into three broad sections. The first section is a kind of introduction to the "articles" of the directives/regulations. They follow the articles and carry equal significance. The second section consists of the articles that provide the definition and clauses that need to be followed by the member countries/companies/and the EU executive body. The last section consists of annexure, which provides an elaborate description and specification of the definition, and also consists of application formats for the companies/institutes.

2001 Directive compared with the 1990 Directive

The first EU directive on GM technology was passed in 1990. The 1990 Directive was amended several times and in 2001, a new directive replaced it. Though this study spans from the year 2001 – 2010, we can consider 1990 to be the base year for better understanding of EU's position as reflected in the subsequent directives and regulations.

By comparing the directives of 1990 and 2001, one does not find any difference in the overall goal. They remain the same as: protecting environment, safety to the human beings, and providing uniform scope for marketing GM products across EU. The difference lies in the "scope" of the two directives (Page 1, para 2; 2001 Directive). The 2001 Directive covers more issues, consists of elaborate definitions and provides more specific instructions.

Following is a comparison of some of the significant additions/modifications in the articles of 2001 Directive, compared to 1990:

Public Consultation. Directive of 1990 states:

“Where a member state considers it appropriate, it may provide that groups or the public shall be consulted on any aspect of the proposed deliberate release (Article 7, 1990 Directive).”

The same clause was modified in 2001 Directive, which states:

“Member States shall, without prejudice to the provisions of the Articles 7 and 25, consult the public and, where appropriate, groups on the proposed deliberate release. In doing so, Member states shall lay down arrangements for this consultation, including a reasonable time-period, in order to give the public or groups the opportunity to express an opinion (Article 9, 2001 Directive).”

“Without prejudice to Article 25, upon receipt of notification in accordance with Article 13(1), the commission shall immediately make available to the public the summary referred to in Article 13-2- h (Article 24, 2001 Directive).”

The articles of 1990 and 2001 stated above provide instructions to the member states for consulting common people on GM food or related products. However, there is a difference in the emphasis of *words*. The 1990 Directive states, “Where a member state considers it appropriate, it may provide that groups or the public shall be consulted...” which shows that it is not binding, while the 2001 clause clearly states, “Member States shall, without prejudice to the provisions of the Articles 7 and 25, consult the public and where appropriate the groups...” Which means it should consult the public however, it may consult the “groups”. “Publics” & “Groups” are not defined in the directive however it may be assumed that publics mean the common people while

groups mean the environmental/farmers/ethical groups. The article in 2001 Directive also emphasizes on the “arrangements” and “time-period” for the consultation.

It is quite apparent that in 2001, taking the opinion of the people became important and EU wanted this aspect to be emphasized in the directive. However, does this incorporation show a sign of harshness or less accommodative nature of the EU toward the GM? Perhaps yes, it did increase the scope of voicing opposition by the people/groups that may impede or stop the import/cultivation of any of GM food/products/crops. So, this particular aspect of the 2001 Directive points toward harshness compared to 1990.

Ethics. There is no mention of “ethics” in the Directive of 1990, while the 2001 Directive clearly states:

“Without prejudice to the competence of Member States as regards ethical issues, the commission shall, on its own initiative or at the request of the European Parliament or the Council, consult any committee it has created with a view to obtaining its advice on the ethical implications of biotechnology... (Article 29, 2001 Directive)”

The lack of any reference on ethical values regarding GMOs in 1990 clearly shows this issue was not important or was very insignificant in 1990. On the other hand, the 2001 Directive clearly mentions how the commission should go about in consulting ethical issues. Again, does this introduction of the ethical values give a sense of harshness or less accommodation of the technology? Perhaps, yes. It does give the scope of raising an issue that has the potential to stop or impede the diffusion of GM technology into EU.

Labeling of GMO products. Labeling of GMO product is done to make sure that the consumers know whether they are purchasing conventional or genetically modified food. In countries such as USA, this measure is not taken; however in EU labeling laws are very strict.

“Whereas that notification should contain a technical dossier, of information including a full environment risk assessment, appropriate safety and emergency response, and in the case of products, precise instructions and conditions for use, and proposed labeling and packaging (Introduction, 1990 Directive).”

“In order to ensure that the presence of GMOs in products containing or consisting of genetically modified organisms is appropriately identified, the words “This product contains genetically modified organisms” should appear clearly either on a label or in an accompanying document (Introduction, 2001 Directive).”

“Member states shall take all necessary measures to ensure that at all stages of the placing on the market, the labeling and packaging of GMOs placed on the market as or in products comply with the relevant requirements specified in the written consent referred to in Articles 15 (3), 17(5) and (8), 18(2), and 19(3) (Article 21, 2001 Directive).”

Both 1990 and 2001 Directive talk about the labeling of products, but the 2001 directive is more specific on what exactly should appear on the product. This clarity on the issue further narrows down any possibility of creative maneuvering by the suppliers in providing information to the consumers. Moreover, the specifications add to the cost of packaging, which increases the price of the whole product. Perhaps, this specificity of the directive makes the legislation more stringent to the companies.

Traceability. “Traceability” in the directives means linking the GM product with all the stages of modifications it has gone through.

“Member states shall take measures to ensure traceability in line with the requirements laid down in Annex, at all stages of the placing on the market of GMOs authorized under part C (Article 4 (6) 2001 Directive).”

The 1990 Directive does not mention traceability; however the 2001 Directive mentions this issue. Here readers may be reminded that keeping records of traceability means adding more work and burden on the companies, thus making the legislation harsh on them.

The 2001 Directive also highlights the provision of penalties, which is absent in the 1990 Directive. Article 33 of the 2001 Directive states, “Member States shall determine the penalties applicable to breaches of the national provisions adopted pursuant to this Directive. Those penalties should be effective, proportionate and dissuasive.” Beside these clauses, the definitions of technical terms in the 1990 Directive also got modified.

“...Placing on the market means making available or supplying to third parties (Article 2 (5) 1990 Directive).”

Whereas in the 2001 Directive the definition is:

“Placing on the market” means making available to third parties, whether in return for payment or free of charge (Article 4 (4) 2001 Directive).”

The inclusion of the terms “or free of charge” increases the scope of the directive to cover the GM transactions even if it is a free gift.

Overall comparing the 1990 Directive with 2001, two things could be clearly noticed: (a) It became comparatively tough for the companies/suppliers or cultivators to sell or grow the GM crops/food, (b) the scope and clarity of the clauses increased in

Directive of 2001, which shows an increase in the understanding of GM issue and its applications.

2003 Regulations compared with 2000 Regulations and 2001 Directives

In 2003 two sets of regulations were passed and until today they are considered to be the basic regulations for GM food and feed. The 2003 Regulation consists of new additions and also clauses from previously enacted regulations. For instance some of its articles are based on regulations that were passed in the year 2000, while others are from 2002 Regulation, while some of the articles are also derived from the 2001 Directives.

In order to get a relative picture of regulations, an attempt is made to compare three significant issues: “labeling”, “traceability” and “public information” as stipulated in the 2000, 2002 and 2003 Regulation and in 2001 Directive.

Labeling. The articles 2, 3 and 4 of 2000 (50) Regulation describe various uses of GM in food, like flavorings, additives and provides specifications for labeling, while 2003 Regulation adds a few more specifications.

“where the food is offered for sale to the final consumer as non-pre-packaged food, or as pre-packaged food in small containers of which the largest surface has an area of less than 10 cm², the information required under this paragraph must be permanently and visibly displayed either on the food display or immediately next to it, or on the packaging material, in a font sufficiently large for it to be easily identified and read (Article 13 1 (d), 2003 Regulation).”

“In addition to the labeling requirements referred to in paragraph 1, the labeling shall also mention any characteristic or property, as specified in the authorization, in the following cases :(a) where a food is different from its conventional counterpart as regards the following characteristics or properties (b) where a food may give rise to ethical or religious concerns (Article 13 (2), 2003 Regulation).”

The requirements of additional and more specific information would have raised the price of GM food products. Moreover, the information on ethical and religious concerns would have inhibited the consumers from buying the product who may have not known the ethical/religious values attached to such modifications. In addition to that, the large font size and the separate placement of it from conventional food stalls might have further separated GM food from the conventional ones. From the above argument one can infer that compared to 2000 Regulation and the 2001 Directive, the 2003 Regulation was harsher for the companies that dealt with GM food or feed in EU.

Traceability. Another important aspect that was modified in 2003 Regulation was the issue of traceability. The 2000 Regulation does not talk about traceability, 2001 Directive talks succinctly about traceability, however the 2002 Regulation elaborates on this issue. On the other hand the 2003 Regulation, besides having all the clauses of 2002, also adds a few more.

“Food and feed business operators shall have in place systems and procedures to identify the other businesses to which their products have been supplied. This information shall be made available to the competent authorities on demand (Article 18 (4), 2003 Regulation)”

“In the case of products consisting of or containing mixtures of GMOs to be used only and directly as food or feed or for processing, the information referred to in paragraph 1(b) may be replaced by a declaration of use by the operator, accompanied by a list of the unique identifiers for all those GMOs that have been used to constitute the mixture (Article 4 (3), 2003 Regulation).”

“In accordance with the procedure referred to in Article 10(2), the Commission shall: (a) prior to the application of Articles 1 to 7 establish a system for development and assignment of unique identifiers to GMOs (Article 8, 2003 Regulation).”

Compared to the 2001 Directives, one finds a shift on the onus of determining the traceability from the member states to the companies and suppliers. In addition to that, the 2003 Regulation asks for specific information that the companies should keep as records, to trace the GM food products they are selling. Compared to the 2001 Directive, the specifications on the tracing mechanism in 2003 Regulation surely added to the burden on the companies. As said earlier, the 2003 Regulation is derived from 2002 Regulation; however there is one addition in 2003 Regulation. It introduced the concept of “Unique Identifiers.” “Unique identifiers” are derived from the codes provided to GM food or feed. This mechanism makes it easier for the authorities to trace the stages of modification. Though this new mechanism does not hint at harshness or leniency of regulation, it does show the enhancement in understanding of GM technology as a whole.

Public Information. The 2001 Directive clearly mentions that general public needs to be consulted on GM issues.

“Without prejudice to Article 25, upon receipt of notification in accordance with Article 13(1), the commission shall immediately make available to the public the summary referred to in Article 13(2) (h). The Commission shall also make available to the public assessment reports in case referred to in article 143, the public may make comments within 30 days. The commission shall immediately forward the comments to the competent authorities (Article 24, 2001 Directive).”

“...In specific circumstances where, following an assessment of available information, the possibility of harmful effects on a risk for human or animal health, then, depending on the nature, seriousness and extent of that risk, public authorities shall take appropriate steps to inform the general public of the nature of the risk to health, identifying to the fullest extent possible the food or feed, or type of food or feed, the risk that it may present, and the measures which are taken or about to be taken to prevent, reduce or eliminate that risk...(Article 12, 2002 Regulation).”

Article 12 of 2002 Regulation besides making the general information open to public, also emphasizes the need to be more careful in informing the food type, risks involved, measures taken etc, in specific cases where the possibility of harmful effects become known.

“The Commission shall establish and maintain a Community register of genetically modified food and feed, hereinafter referred to as ‘the Register,’ the Register shall be made available to the public (Article 28, 2003 Regulation).”

The addition of the clause of keeping a register and making it public makes the process all the more transparent. Though this clause makes the process more democratic, it may have provided more scope for opposition and thus made selling of such products tougher than before.

Authorization Procedure. The process of authorization seems to have become centralized after the establishment of European Food Safety Authority (EFSA) through the 2002 Regulation. In 2001, applications were sent to the national authorities that used to assess and provide opinion to the commission and other member countries. In doing so the national authorities consulted the people and groups. The article 5 of 2003 Regulations gives the responsibility of approving the GM products to EFSA. The applications for selling GM food/feed are first sent to the national competent authority and within 14 days they are sent to the EFSA, by the national authorities. The EFSA also referred as “authority” in the regulations, assesses the application and gives an opinion to the member countries and the European Commission and also to the common people. The people or groups have 30 days to comment on the opinion. The

commission then finalizes the approval. After the establishment of European Food Safety Authority in 2002, the authorization procedure became more centralized leaving less room for delays by the national authorities on releasing GM food/feed. It also reduced the chances of other countries asking the commission to reinvestigate the case if they were not satisfied with the report of the country that made the assessment. This clause does not show whether legislation became harsh or lenient, but it does show that the companies were to be assessed by one EU authority, which may have removed the chances of delay in introducing the product due to disputable claims by the member countries.

CRL. Another significant addition in the 2003 Regulation was the introduction of Community Reference Laboratory (CRL) also referred as EU's joint research center. The role of the CRL is to assess the GM food/feed that are to be placed in the market, and provide feedback to the commission for acceptance/rejection.

“The Community reference laboratory and its duties and tasks shall be those referred to in the Annex. National reference laboratories may be established in accordance with the procedure referred to in Article 35(2)...applicants for authorization of genetically modified food and feed shall contribute to supporting the costs of the tasks of the Community reference laboratory (Article 32, 2003 Regulation).”

The additional cost of the CRL in 2003, may have further added a burden on the companies making the regulation even harsher compared to 2002 or 2001.

Overall, the comparison of the regulations and Directives on the issues of labeling, traceability and public information, reveals that the 2003 Regulation made it all the more tough for the companies to sell GM food/feed in EU markets. However, the 2003 Regulation also reflect the increase in the effort to accommodate the technology.

This is reflected by the introduction of new scientific ideas such as locating threshold of GM content in non-GM food. In addition to that, the introduction of “unique Identifiers” and the Community Reference laboratory would have made the assessment of GM food all the more scientifically sound. So, on the one hand EU seems to have become tough on the companies while at the same time it also tried to accommodate the technology by introducing new scientific discoveries on GM technology and by establishing research laboratories for assessment.

EU 2006 Regulations compared with 2004 and the 2003

As stated earlier, the 2003 Regulation is considered to be the basic regulation governing the GM food and feed even today (Europa, 2010). However, 2003 Regulation was further amended by 2004 Regulations and 2006 Regulations. Both 2004 and 2006 Regulations are very specific; 2004 Regulation reflects the introduction of new scientific ideas related to “Unique Identifiers”, while the 2006 Regulation is on the establishment of “National Reference Laboratory.”

“Where consent or authorization is granted for the placing on the market of a GMO: (a) the consent or authorization shall specify the unique identifier for that GMO; (b) the Commission, on behalf of the Community, or, where appropriate, the competent authority that has taken the final decision on the original application shall ensure that the unique identifier for that GMO is communicated as soon as possible, in writing, to the Bio-safety clearing house; (c) The unique identifier for each GMO concerned shall be recorded in the relevant registers of the Commission (Article 3, 2004 Regulation).”

This article of 2004 Regulation does not introduce a new concept. Moreover, even prior to the 2003 Regulations, companies had to provide documents to trace the GM products. The difference lies in the fact that EU Regulations of 2004 made the

procedure more scientific. This particular article indicates the accommodative nature of the EU toward the technology; however it does not show harshness or leniency of the regulation toward the companies.

The article 32 of 2003 Regulation talks about the responsibilities of Community Reference Laboratory and also the financial obligation (not specified) of the companies toward it. The 2006 Regulation focuses on the establishment of the National Reference Laboratories (NRL), and also specifies the financial contribution to be made by the companies to the CRL and its relationship with NRL.

“The applicant shall provide evidence that the flat-rate contribution of EUR 30 000 referred to in Article 3(1) has been paid to the CRL when it submits the samples of the food and feed and their control samples to the CRL (Article 5 (1) 2006 Regulation)”

“The contributions mentioned in paragraph 2 to 5 shall be payable by the applicant within 45 days of the date of reception of the notification (Article 5, (7) 2006 Regulation).”

“The CRL and the national reference laboratories listed in Annex II shall enter into a written agreement to define the relations between them, notably in financial matters. In particular, the written agreement shall provide that the CRL is to distribute a share of the financial contributions it receives to the national reference laboratories (Article 6 (2) 2006 Regulation).”

The 2006 Regulation specifies the amount paid by the companies and the detail procedure related to it. It also talks about exceptional cases in reducing the amount. The 2003 Regulation on the other hand does not specify the amount or the procedure for payment. The specification of amount does not reflect any kind of leniency or harshness on the companies; however, following the strict procedure for supplying the information and making payment, may have added a new element of burden among the

companies. The introduction of National Research Laboratories however also reflects that EU seems to be incorporating the views of scientists of member countries to assess the risk of the GM products.

2008 Regulations compared with the previous Regulations

The 2008 Regulation, which is an amendment to the Regulation 2003 talks only about the powers, conferred the commission.

“The Commission should be empowered to define whether a type of food or feed falls within the scope of Regulation (EC) No 1829/2003, to lower the thresholds for the labeling of the adventitious and technically unavoidable presence of material which contains, consists of or is produced from genetically modified organisms (Introduction, Para 4, 2008 Regulation).”

The amendments show that EU was trying to centralize the powers to amend or approve GM food or feed so that uniformity in scientific approval is maintained at the EU level (Here it can be mentioned that in the newspapers EU is seen as centralizing the scientific approval process and giving independence to the member countries to take the final decision). The amendments done after 2008 do not show clear trends, and therefore it can be assumed that the stance as reflected through legislation remained constant until 2010.

Overall assessment of Directives & Regulations from 2001- 2010

Upon comparing the regulations and directives from 2001-2010, there seem to be a few distinct trends:

The legislation seems to have become harsh for the companies over the period. One of the important clauses added in the regulation and later made more stringent was that of “labeling” of GM products. Labeling of a product raises the production cost

and therefore the companies have to sell it at a low profit margin. Labeling also makes people know the risks involved with GM food. Though this practice is favorable to the consumers; potential consumers may not buy the item if they are provided with the risks (that are not proven yet) associated with the product.

Traceability of the GM food/feed was another clause that increased the burden on the companies. Traceability means tracing the gene modification of that product since its origin. To keep the records of traceability proves to be an additional burden to the growers or the sellers.

Another trend was that the legislation started becoming transparent toward the public. More and more clauses were added on taking public opinion before introducing GM food into the market. The element of ethics was also included in the legislation. The increase in public opinion might have increased the harshness level on the companies, as then they would be confronted with more conflicting opinions. However, increase in transparency also increased the democratic procedure in the selection of GM products.

The regulations and directives also show that there was an increase in understanding of various issues related to GM technology and its use. For instance, the number of terms defined in the directives and regulations were increased. The establishment of EFSA was another step toward accommodation of the technology. Additionally, the introduction of new scientific idea of “Unique Identifiers” and the establishment of “Community and National Reference Laboratories” show that EU was opening up for technologies related to GM, though it was not for producing GM food but for assessing the viability and risks associated with the products.

In a nutshell the legislation shows that EU's stance during the period was moving toward advocacy for the companies dealing in GM food/feed/crops. Interestingly, the legislation also shows that EU stance on GM technology (for assessing the risks) was moving toward accommodation during this period.

RQ4: What were the stances of EU as reflected through the media?

The analysis was begun with the year 2001 because EU came up with a new directive in that year following an "unofficial" moratorium of GM food/feed/crops in between 1998 and 2001. The first report in 2001 that came out in January was however compared with the 1998 moratorium, to get the comparative position of EU in 2001. The rest of the analysis is divided into three phases: 2002-2003, 2004-2006 and 2007-2010. Emphasis was given to official statements of European Union officials/ministers and to the approval of GM crops/food/feed to demonstrate the harshness/leniency of EU as an institution.

EU's Stance as reflected in The New York Times

2001. A total of 11 relevant stories were published in the newspaper during this year. Four of them focused on the European Union and genetically modified food while the rest focused on European foreign policies in general. All the stories were examined to observe EU's position (the factors influencing EU's stance are explained in another section).

Compared to 1998, the stories from 2001 reveal a somewhat more favorable stance. The January 3, 2001 story "Eating well; Labeling Foods With Designer Genes" was on a report of an international committee called "European Union-United States

Biotechnology Consultative Forum.” The committee favored genetically modified food but with strict regulations. It had 20 members from across many fields such as science, law, ethics, etc, and they were from both EU and the United States. Dr. Cutberto Garza, who was the co-chairman of the international committee, was quoted as saying:

“(The effort of the committee was) ...an honest effort to move past people saying ‘You just don’t know’ and the other side saying ‘Frankenstein’.”

The above quote along with the recommendations of strict regulations by the committee reflects a stance somewhere in between “yes” and “no.” Since the committee was formed with the support of EU, it may be taken as softening stance of EU compared to the complete ban on the imports in 1998.

The story published on January 11, “Two Named to New German Agency in Shuffle Over Beef Disease” focused on the outbreak of mad cow disease in Germany. The story reveals a slightly different picture. Here it may be mentioned that the EU comprised of 15 member countries in 2001, most of which had favored a complete ban in 1998; Germany being one of them. The story is on the resignation of the Health and Agriculture Minister in Germany who resigned because he could not stop the outbreak of mad cow disease. The German Chancellor, Gerhard Schröder handed the ministry to environment oriented Green Party, and the German Foreign Minister was quoted as saying:

“Europeans do not want genetically modified food---period.”

The resignation and the quote hint at the continuation of an adversarial stance at least in Germany toward anything that was genetically modified.

Another significant story “Europe approves strict food rules” which came out on February 15 was on EU parliament’s approval of the 2001 Directive. The parliament approved the legislation by a margin of 338-52, however with stringent rules. The French government issued a statement saying that the governments of Austria, Denmark, Greece, Luxemburg, and Italy wanted a ban of the GM crops and food. To this, David R. Bowe, the British legislator who drafted the GM legislation replied:

“They could have blocked the legislation if they had an objection.”

The statement of the French government and the reply of British legislator show that overall EU’s stance was favorable in spite of opposition from member countries.

The story “Nations Back Freer Trade, Hoping to Aid Global Growth” published on November 14 showed how most of the countries across the world at the WTO meeting tried to push for free global trade. The story also stated that they had been pushing EU to adopt softer regulations.

Overall, compared to the 1998 ban on GM food imports, in 2001 EU was becoming more favorable toward GMOs, though with strict regulations. Additionally some of the member countries like Germany and France were still maintaining their hardliner stance, and most of the countries across the world led by the US, were pushing EU to adopt a softer stance.

2002-2003. A total of 38 stories related to genetically modified food and crops were published during 2002-03; 7 of them in 2002 while 31 of them in 2003. The abrupt

increase in the number of stories in 2003 may suggest an increase in concerns and controversies on GM crops and food in EU.

During the period, it seems EU officials were trying to avoid the pressure of the US and other countries by giving favorable statements, but in practice they were delaying the approval of GM food/crops and also approving harsh regulations on GMOs. Perhaps this was because of strong opposition within European Union office.

The quote in the story “Europe in Shift on Genetic Food” published on March 2, 2002 was perhaps to tackle the international pressure diplomatically. The trade director of EU in the story said:

“Under best case scenario, pipeline products could be on shelf by summer of 2003.”

However, the United States trade officials were not satisfied with mere statements and urged the Bush administration to file a suit in the World Trade Organization. According to them as quoted in the same story:

“Even though the legislations have been passed only few varieties are imported into Europe.”

The two quotes from two different sides seem to indicate that EU officials were trying to show that EU was moving ahead with its softer stance, however they were still reluctant in approving new genetically modified products. Perhaps this was because of conflicting opinion of ministers from within EU. Here it can be mentioned that only those GM food/crops that were approved prior to 1998, were being imported in EU during 2002. No new varieties were being approved and the accusation of the US officials was on approving new varieties.

The story “Prison Looms for French Farmer, an Anti Globalization Gadfly,” published on November 20, 2002 showed the resentment of French people toward GM food. The story is based on the French Court verdict against a celebrated sheep farmer named Jose Bove, who attacked the research fields on genetically modified crops and a McDonald’s restaurant in 1998. Though the French court imprisoned him, the reported popularity of Jose Bove shows that many French people thought the same about GMOs. The story does not reveal the stance of EU but it does show that people and their representatives in one of the member countries were not in favor of genetically modified food or the process of globalization.

The other stories such as “Between Famine and Politics Zambians Starve”, “Zambian Leader Defends Ban on Genetically Altered Foods”, that were published on August 30 and September 4, showed that the US officials were blaming EU for inspiring other countries in maintaining moratorium on GMOs.

Overall, the 2002 stories indicate two aspects: (a) EU officials were becoming softer in their stance on GM food though in practice they were still reluctant in approving GM food because of the opposition of EU ministers, (b) Strong public opposition on GM crops/food continued in member countries such as France.

In 2003, most of the stories published in the first half of the year, for instance; “U.S. Threatens to Act Against Europeans Over Modified Foods”, “U.S. Delays Suing Europe Over Ban on Modified Food”, “U.S. Contests Europe's Ban On Some Food” and “Precaution Is for Europeans”, are based on the pressure applied by the US and the resistance of the EU. Finally in May 2003, the Bush administration filed a case against EU

at the WTO on this issue. Interestingly the EU officials were surprised and Pascal Lamy, the top EU trade official was quoted in the story “U.S. Contests Europe's Ban On Some Food,” published on May 14, as saying:

“The US claims that there is a so called moratorium, the fact is that EU authorized GM varieties in the past and is currently processing the applications.”

Though the quote indicates that EU was in the process of approving GM crops and food, the delay in the process however indicates that it was still very reluctant in doing so. Here, it would be worth mentioning that in 2001 EU had approved the new GM directive, and more than two years had passed, reportedly without approval of any new crops.

The July 3, 2003 story “Europe Acts to Require Labeling of Genetically Altered Food” stated that EU parliament approved strict legislation on the import of GM food and feed by introducing “labeling” and “traceability” of the GM products that would have added to the production cost. The approval of harsh regulation as projected in the story shows that EU was getting stricter compared to 2001. However, the story “Italy Loses Ruling on Modified Food” published on September 10, stated that the European Court of Justice gave a ruling against Italy's decision on banning foods derived from genetically altered corn. The ruling shows that even though EU was maintaining a stricter stance, it was not in favor of completely banning the GMOs in any of the member countries.

Another development noticeable in the stories was the widespread opposition over GM food across many European countries. The story “Consumers in Europe Resist

Gene-Altered Foods” published on February 11, 2003 showed resistance across Europe on the issue. According to the story all across Britain and most of Europe, it was still difficult to find any GM product in the market. Another story “Thousands Rally in France, Trade Battle in Mind”, published on August 8, 2003 was on the demonstration by thousands of people against globalization and genetically altered food in France.

Overall in 2003 the reports reveal public opposition to be more or less the same as it was in 2002. The EU officials were giving favorable statements but were still hesitant in approving any crops. Additionally, the reports also stated that EU approved a strict legislation in 2003, showing the harsh stance compared to 2002.

2004-2006. From 2004-06, there are total of 27 stories on European Union and genetically modified food. Out of these, about 18 specifically focus on EU and GM food, while the rest are on the EU’s foreign relations with the United States.

On April 21 2004, the story “Modified Food Labeling Begins in Europe” was pegged around the beginning of food labeling in EU markets and restaurants. The story carried the quotes of restaurant managers and the customers. The spokesperson of a restaurant was quoted as saying:

“We will not stock anything that has been altered.”

The story also quoted a customer:

“I do not want to shop with suspicion.”

According to the report, some customers even wanted labeling on meat, eggs and milk that were from the cattle raised on GM feed. The story reflects the continued public apprehension over GM food in some countries.

The story published on May 15, 2004 “Europeans Appear Ready To Approve a Biotech Corn” was on EU’s optimism in the approval of genetically modified corn called “Bt corn” (meant for import and not for cultivation). The story stated that the approval would end the 6-year moratorium on import of any new variety of GM food. Another report published on July 20, 2004 “Europe Approves Genetically Modified Corn as Animal Feed” stated that EU approved a variety of GM corn produced by Monsanto for animal feed. A spokesperson of Monsanto was quoted as saying:

“Europe’s decision on Monday represents definite progress.”

However, the Bush administration categorically stated that US would not backtrack from the case against EU at WTO.

The approval of new GM food/feed showed that in 2004, EU was opening up for new varieties, however with strict regulations. Here it may be mentioned that in 2002 & 2003 it was yet to make any progress on approving any food/feed or crops, therefore the year 2004 can be taken as somewhat positive compared to the previous years.

In 2005 EU showed a harsher stance compared to 2004 as far as GM feed (animal food) is concerned. This perhaps happened because of a particular incident. In April 6, 2005, the company Syngenta declared that GM Bt10 seeds of corn got mixed with the GM Bt11, and this batch was supplied to EU. Bt10 has the gene that shows antibiotic resistance and therefore may not be good for human health. Though EU did not take any direct action against the company, the same month it passed tougher rules on GM feed. The story “Europeans to Toughen the Rules on Animal Food From US” published on April 13, stated that EU was approving stricter rules on GM feed to prevent the

unapproved GM feed from entering EU. It did not do so for products meant for human consumption, because Bt10 strain was not found in that.

On February 8, 2006 the story was based on WTO giving its verdict against EU on GM food. EU however said that it has broken the moratorium in 2004 and therefore the decision of WTO was debatable. In another story, "Biotech Tears Rifts in Europe" that came out on June 6, 2006, the spokesperson of the Farmers Union in Greece was quoted as saying:

"Environment minister who allows GM food in his country would never be a minister again."

The story also stated that five of the countries still maintained moratorium on planting GM crops in their countries.

Overall from 2004-2006, if we go by the reported approval of GM food/feed, the year 2004 did show a favorable stance, but then again in 2005 and 2006 EU became reluctant in giving approvals. Additionally, the EU's position on GM feed got stricter in 2005 due to the GM Corn controversy.

2007-2010. In 2007, the search result showed 6 stories on the issue. The stories revealed intense debate within EU over the approval of GM food/crops and the increasing official statements that were in favor of it.

In July 2007, the news report "A Genetically Modified Potato, Not for Eating, Is Stirring Some Opposition in Europe" was centered on the debate on approving a potato called "amflora", meant to be grown inside EU. In 2006 EFSA had approved it and EC had given a statement indicating its approval. But the approval required 74% of the vote by the ministers and the ministers could not come to a conclusion in 2006 and neither in

2007. The story quoted Barbara Helferrich, Spokeswomen for EC's environment directorate as saying:

"The ministers have not been able to take a decision so we will have to reaffirm our earlier opinion to recommend it."

According to the story, this statement had the backup of the EFSA's approval and shows somewhat positive stance of the EU officials. However, in the same story the head of the unit for gene technology at German Ministry of Food, Agriculture and Consumer Protection, Wolfgang Kohler said:

"I am very doubtful we could vote in favor of food and feed because of fears about transmission."

The amflora controversy highlights a couple of stances within EU. The EFSA, which is a scientific body assisting EC, showed a favorable stance by approving the crop. The quote of the EC environment official too reflects a favorable stance. However the ministers who belonged to some member countries were opposed to it.

In another story "European Official Faults Ban on Genetically Altered Feed", published on November 27, 2007 the European agriculture commissioner, Mariann Fischer Boel, is stated to have pushed for relaxing the GM feed regulations. The officer found that the existing GM regulations were raising the livestock prices. Overall, the reports in the year 2007 show that the opinion in favor of GM products was getting stronger within EU.

In 2008 a total of 6 stories were published; however, they are mostly on the subject of cloned animals, which is beyond the scope of the study. These stories were however, examined to link any statement of EU with GM crop/food. Though they do not

reveal the stance of EU on GM crops/food they do indicate that the ethical group within EU dominated the scientific decisions on cloned animals during 2008.

In 2009 the search results show only 3 stories; however they reveal very interesting stance of EU. The union was getting favorable toward GM crops/food, at the same time it was allowing the member countries to ban or approve within their jurisdiction.

On March 3, 2009, the story "Europe to Allow Two Bans on Genetically Altered Crops" stated that Austria and Hungary were allowed by EU to ban the cultivation of GM Maize. In April 15 the story "Germany Bars Genetically Modified Corn" states that Germany also decided to ban the crop. The German agriculture minister Ilse Aigner said:

"I have come to the conclusion that there is a justifiable reason to believe that genetically modified maize of the type MON 810 presents a danger to the environment."

The third report "Canada Settles a Crop Trade Complaint Against Europe" that came out on July 16 stated that Canada took back the charges against EU at WTO when EU agreed to import Canada manufactured GM Canola seeds. The European Union trade commissioner, Catherine Ashton said she hoped to reach similar agreements with Argentina and the United States.

During 2010 the search results show 7 results and they reflect the growing favorable stance of EU. The story "In Europe, a Move to Ease Curbs on Growing Biotech Crops" published on July 8 revealed that EU continued with the softening stance on growing the GM crops, however it allowed the countries to take their own decision on the import or plantation of GM food/feed/crops.

The latest story “Setback Seen for E.U. Plan on Biotech Crops” that came out on November 11, 2010 indicated that the plan of EU (of giving independence to member countries) might fall in trouble. The story stated that one of the first things European Union commissioner for health and consumer affairs, John Dalli, did after joining EU in 2010 was to approve the planting of amflora potato in Europe. Mr. Dalli then proposed a radical overhaul of the existing rules to give independence to the member countries. According to the report “his goal was to make future approvals of biotech crops swifter and less acrimonious by effectively allowing countries to opt out.” However the same story also stated that, “lawyers working on behalf of European Union governments in Brussels were expected to issue a legal opinion concluding that the plan (of giving independence to the member countries) would violate European law and global trade rules.”

Overall in 2010, the stories indicate that EU as a body was trying to be favorable toward GM food/feed and crops but it was also giving independence to the countries to take their own decision. This strategy of EU is however being questioned by the lawyers in the latest reports.

Summary of Stances -The New York Times

The stories in The New York Times reflect a complex set of stances of EU; for instance the stance of the general public in some of the member countries showed opposition to GM products. The scientific body of EU “European Food Safety Authority (EFSA)” showed favorable stance on selected products. Some EU ministers/officials were

completely against GM products while others were becoming favorable owing to the rising prices of conventional food and due to international pressures.

Amidst these complex sets of stances however, an attempt can be made to see the overall shift in the mood of EU as a body. In 2001, the quotes and also the approval of new directive clearly show that EU was in favor of breaking the 1998 moratorium. The stories in 2002 however reveal that even though EU was interested in opening up in its viewpoint, it was still reluctant in approving any GM product. The strict regulations on GM food passed by EU in 2003 shows the pushing back of the favorable mood generated in 2001. In 2004 amidst stiff opposition it approved few varieties of GM food/feed, showing some positive movements but again in 2005 it came up with stricter regulations on GM feed. In 2007 the debate over the approval of GM “amflora” potato for cultivation, showed the growing positive opinion on GM within EU. Perhaps the approval of crops by scientific body, the rising prices and the international pressure was forcing EU to debate on approving GM crops, which was never done earlier. In 2009-10, EU further started softening, which is reflected from the approval of the GM crops/food. However, it also started giving more independence to the member countries to take their own decision on approving or rejecting them.

EU’s Stances as reflected in The Times, UK

“The Times” was founded in 1785 in UK and was initially called “The Daily Universal Register”. Reportedly the newspaper has lent names to several other newspapers, and to distinguish it from them the paper is often referred as the “London Times” or “The Times of London”. For the purpose of the thesis, reports from “The

Times of London” have been examined from 2001-2010. Similar to the “New York Times,” search was done by the keywords “European Union and Genetically Modified Food” every year starting 2001, and the analysis is divided into four phases: 2001, 2002-2003, 2004-2006, & 2007-2010.

2001. A total of 4 stories were published in the newspaper during this year. Two of them focused on the European Union and genetically modified food while the remaining 2 were on EU’s foreign relations with America. All the stories were examined to get the position and the factors influencing the stance of EU that are explained in a different section of the paper.

Compared to the 1998 unofficial moratorium on GM Food/crops, the 2001 stories reveal a favorable stance. The report on February 12, “French threaten to thwart deal on GM crops” shows that EU was moving ahead toward breaking that moratorium. The story quotes David Bowe, the British labor MP who was behind designing the Directive as saying:

“These are the tightest GM laws in the world.”

In the next quote he says:

“People opposed to the directives are against GMOs in principle. In my view, the argument they are making on public safety and health grounds are pretty spurious.”

The report on February 15 was based on the approval of the 2001 Directive in the EU parliament. Three thirty eight votes went for it, while 52 were against. Six out of the 15 countries were not ready for approving the directive. EU officials also hinted at supplementing the directives with labeling and traceability of GM products. The other 2

stories “Despite Kyoto, Europe must cool its heated anti-US climate” and “Uncle Sam is really the target at Genoa” show the widespread European opposition against the US agenda of globalization, including genetically modified products.

Overall, the stories reflect that EU was moving toward a favorable stance in 2001, but with much opposition from some of the member countries.

2002-2003. In 2002, 4 stories were published on the issue. The May 24, 2002 story “GM food labeling row could mutate into trade war” states that a committee of the House of Lords in UK, sided with US against EU, on the issue of labeling and traceability of GM food. Tony Blair, the Prime Minister gave a statement:

“In GM crops I can find no serious evidence of health risk.”

The story on September 11, 2002, “Doors are opening for GM food” clearly stated that David Byrne, the EU commissioner for public health and consumer protection was in favor of biotechnological innovations in farm and food sector inside EU. The other two stories do not reveal the position of EU.

Though the statements of the Prime Minister and the EU Commissioner cannot be taken to be the opinion of EU, they do reflect countries such as UK and the EU officials were openly favoring the GM Food.

In the year 2003, 27 stories were published on this issue. Throughout February until May, most of the stories were based on the US putting pressure on EU for softening its stance over GMOs. But in spite of the pressures, as the story “Europe sets rules for labeling GM Food” published on July 3 showed, EU parliament adopted strict legislation on GM food.

During September and October of 2003, scientific reports started to appear that showed environmental dangers in planting GM crops. It was perhaps due to these reports that EU kept on delaying the decision on approving GM crops to be planted inside EU. The story “Beet and Rape Harmful, But Maize Beneficial” (October 17) showed that the scientific evidences were in favor of GM Maize. However the later stories such as “Decision on GM crops Postponed”, “EU under pressure to allow GM Maize”, and then on December 9, “EU criticized for not approving GM Maize” showed that EU was having stiff opposition from within, because of which it was delaying the approval for growing GM crop. Overall, during 2002 and 2003 the stories indicate that EU was opening up at least in its opinion about GM food/crops, but was as strict as before in approving any crop.

2004-2006. From 2004-06, there are 14 reports. Interestingly 12 of them were published in 2004 while 1 each in 2005 & 2006. The story “EU in GM sweet corn move” published on January 13, 2004 showed a positive stance toward approving the corn for human consumption. Another story “Commercial GM crops could be planted this spring” published on January 14, 2004 showed the positive stance. According to the story, a report by UK based Acre or “Advisory Committee on releases to environment” found herbicide tolerant GM maize to have no effect on wildlife. Jules Pertty, Deputy Chairman of Acre was quoted in the story as saying:

“We are saying ‘yes but’ to GM maize and ‘no but’ to beet and oilseed rape.”

Margaret Beckett, the Environment Secretary in UK who welcomed the report stated that her decision would apply across the European Union, as the European

Commission has declared Britain the "competent authority" on these crops. In September 2004 EU according to the reports, approved 17 varieties of GM maize seeds produced by Monsanto. This was an important decision as now the farmers were provided with a variety of seeds on GM Maize. Again, the report published on 24 October reveals that EU approved a variety of GM Corn food.

In 2005 and 2006 only 2 reports came out on this issue. The story on February 1, 2005 was an interview of the outgoing Director General of WTO, Supachai Panitchpakdi. In the interview he states that Peter Mandelson, the EU trade commissioner is taking decisions that reflect positive stance toward globalization. The story published in the year 2006 was based on the FDA's approval of cloned animal products, and does not reflect the stance of EU.

Overall it can be said that the stance of EU was moving in favor of GM food and crops in 2004, though still with precautionary measures. The lack of stories in 2005 and 2006 however make it difficult to conclude as to what was the stance of EU in those two years.

2007-2010. In 2007, the stories focused on the approval of a kind of GM potato called "amflora" for cultivation inside EU. On July 16, 2007 the story "EC is supposed to give a go ahead," highlighted the growing favorable opinion on approving the GM potato. The story stated that if the crop were approved, it would be the second crop (the first being GM Maize) to be grown by EU. In 2008, 6 stories were published and they showed the continued tussle between the ministers and officials to influence the stance of EU. The story published on February 5, "Minister leads fight against GM food,"

stated that the Environment Minister of UK was visiting Brussels to oppose EU's (positive) move on GMOs. The story published on February 14, "Europe faces meat crisis as wrangle over GM animal feeds intensifies" on the other hand highlighted the appeal of the poultry industry to relax GM feed regulations to save the industry. The story on August 14 "Hyperbole or high time to speak out" again showed the growing favorable opinion among the EU officials.

Overall, the stories in 2007 and 2008 show a tussle between the industries representatives, EU officials and the ministers and show a growing favorable opinion within EU.

In 2009, 4 stories were published on the issue. The stories revealed a further increase in the favorable opinion. The story published on August 11, "Livestock farmers threaten to quit industry unless rules on GM feed imports are eased" stated that some ministers were pressing EU to speed up approval of GM crop varieties or risk a collapse in the market for home produced chicken eggs, pork or milk. Hillary Benn, the environment secretary, UK appealed to EU in the story:

"If GM can make a contribution then we have a choice as a society and as a world about whether to make use of that technology and an increasing number of countries are growing GM products."

In 2010, 5 stories were published before November. On March 3, 2010 the story "Industrials; Need to know," stated that EU approved "amflora" potato, meant to be grown inside EU. Other stories such as "Food from offspring of cloned animals is safe, scientists say" were based on the growing favorable stance of the scientific bodies in UK and EU, on cloned animals.

Summary of the Stances-The Times, UK

Since not many stories were published in “The Times” that focused on EU, it would be difficult to show the movement of the stance conclusively nevertheless, a rough sketch can be drawn. The stance resembles what The New York Times projected. In 2001 the approval of the directive and the quotes of EU minister show favorable stance compared to 1998 moratorium. In 2002 however the reports show that no crops were approved. The statements however, reveal that EU maintained its favorable opinion during this period. In 2003 it passed a strict regulation on GM food amidst stiff international pressure, thus indicating a harsher stance. In 2004 the approval of GM food and crops show comparative favorable stance (In 2005 & 2006 the stories were too less to reveal any stance). The 2007 stories showed the increase in favorable opinion, which continued in the stories published in 2008, 2009 and 2010.

RQ5: What internal and external factors influenced the stances of EU?

Internal Factors

General Public. Opposition to genetically altered food by the general public was perhaps one of the most significant factors. The public protests were based on ethical, health and environmental grounds. Newspaper reports clearly indicate that the ministers, who opposed EU’s move were simply voicing the opposition of the people, and not basing their arguments on scientific evidences.

EFSA. The establishment of EU’s scientific body “European Food Safety Authority (EFSA)” also seems to have influenced the stance of EU, though in a

favorable direction. EFSA was a central authoritative body established in 2002. It scientifically assessed all the applications on genetically modified food and provided feedbacks to the EU officials.

Individual Efforts of EU Officials. Perhaps due to the growing economic concerns coupled with the pro scientific evidences provided by EFSA, some EU officials tried to diplomatically solve this deadlock. The story “Setback Seen for E.U. Plan on Biotech Crops” that came out on November 11, 2010 stated that European Union Commissioner for Health and Consumer Affairs, John Dalli, personally tried to solve this deadlock by approving GM crops/food at the union level, and allowing the countries to take their own decision in their area. Though his decisions are still pending, it does show that individual officials had an influence on EU’s stances.

Mad Cow Disease. Another factor that may have had an influence on EU’s stance was the outbreak of mad cow disease. Though the disease was caused by contamination in cow feed, it was linked with all kinds of alterations in the natural food. In the year 2001, the German health minister resigned due to the outbreak of mad cow disease, and the story “Two Named to New German Agency in Shuffle Over Beef Disease,” published in The New York Times, on January 11, 2001, quoted the German Foreign minister as saying:

“Europeans do not want genetically modified food---period”.

The above statement along with other details provided in the story clearly reflect that the outbreak of mad cow disease was not taken in isolation, rather it was linked with all the genetically altered food.

Rising Prices. Several stories in the later part of the decade reflect the influence of rising food prices on EU's opinion. The stories such as; "Relax rules on 'Frankenstein foods' to beat soaring prices, says farmers' chief," "Farmers threaten to quit industry over rules on GM feed," that were published in The Times in 2008, reveal that there was a growing opposition among the farmers on strict GM rules because of rising prices. In the story "In Lean Times, Biotech Grains Are Less Taboo" published on April 21, 2008, the chairman of the European Parliament's Agriculture Committee is stated to have appealed to the Europeans to be more realistic regarding GM products. He was quoted as saying:

"Their (Europeans') hearts may be on the left, but their pockets are on the right."

External Factors

International Pressure. The growing pressure from the international countries led by the United States also seems to have affected the stance of EU. The US administration criticized EU for being reluctant in approving GM products throughout the study period. Their criticism was not only on the grounds that it was hampering the world trade, but also that EU's stance was influencing many underdeveloped countries in which majority of people were starving. In May 2003, the Bush administration filed a case against EU at WTO on the issue and in February 2006, WTO gave the verdict against EU, which may have had an impact on EU's trade, thus influencing its stance.

Scientific Evidences on GMOs from outside EU. The scientific reports on GMOs coming from outside Europe may have also influenced the stance of EU. The June 26, 2002 story "New evidence may forestall GM trials" published in The Times, showed that

the UK and EU became a bit apprehensive toward GM crops. The story was based on the fact that US farmers had to use more powerful chemicals in the fields where GM Maize crops were grown. The scientific evidences such as these may have strengthened the anti-GM lobby within EU.

Carelessness of GM Seed Companies. In 2005, one of the GM seed companies called Syngenta declared that GM Bt10 strain of corn got accidentally mixed with the GM Bt11, and this batch was supplied to EU. Bt10 has the gene that shows antibiotic resistance and therefore is not good for human health. Though EU did not take direct action against the company, the story “Europeans to Toughen the Rules on Animal Food From US” on April 13, 2005 stated that EU approved strict rules on GM feed as a response.

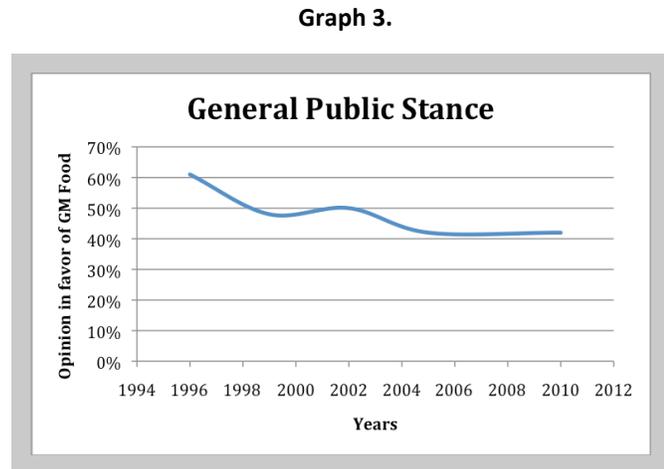
Besides these, there were several other factors that may have influenced the stance; one of them was the position of the Vatican on genetically modified food. Overall it can be said that both, internal and external factors pulled and pushed EU’s stance in one or the other direction.

DISCUSSION AND CONCLUSION

This study examined the conflicts in diffusion of genetically modified food in European Union through general public opinion, legislation, cultivation of GM crops, and media.

General Public

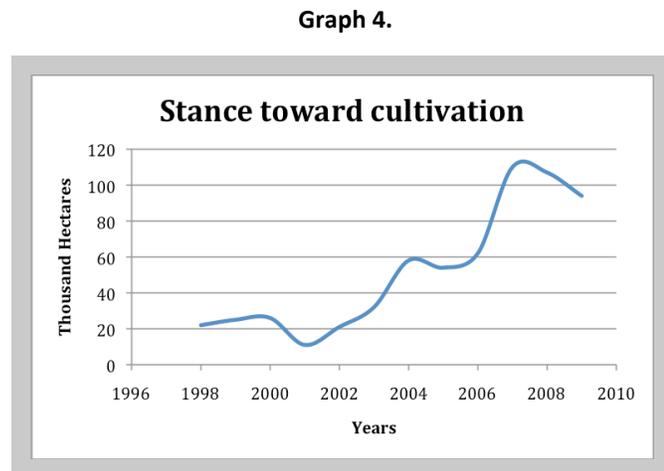
The stance of general public can be seen in Graph 3. The graph is based on EU's survey results of 1996, 1999, 2002, 2005 & 2010. It shows an



almost even distribution of those who favored and those who didn't. Additionally, it shows that the number of those who favored started declining from 1996 then picked up in 2002 but declined again and remained constant after 2005.

Cultivation of GM Crops

Currently five GM crops are cultivated throughout the world in large scale: Soybean, Cotton, Maize, and Rapeseed,



and Sugar beet (Source: GMO Compass). However reportedly only one crop - GM Maize,

was grown on commercial scale in EU until 2010, when another crop “amflora” potato was added onto the list.

Cultivation trend (Graph 4) shows an initial increase and then decline from 1999 until 2001 and then sharp increase with occasional declines. The increase from the year 2001 was perhaps because of the introduction of new set of directives. The increase was perhaps also because countries that joined EU in 2004 and 2007 were in favor of GM cultivation. Initially it was only Spain and later countries such as Czech Republic, Slovakia, and Poland who joined EU in 2004 showed favorable stance toward cultivating the crop.

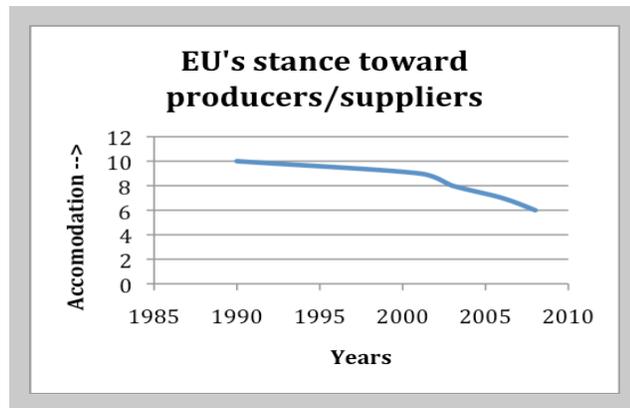
EU Legislation

EU legislation revealed two different stances: (a) toward producers/suppliers (b) toward understanding of the technology.

Producers/Suppliers of GM

Products. If one examines the legislation from the eyes of a company that produces or supplies genetically modified products, the stance of EU seem to have become harsh with the

Graph 5.



introduction of every new legislation after 2001. The following graph is drawn with a rough index. One point is reduced from the previous year if the legislation seems to be harsh and vice versa. The graph by no way gives the exact location of the coordinates; it

only helps readers to visualize the stances. The inclusion of “public opinion” and “ethical values” in the 2001 Directive made it harsher compared to 1990. In 2003, EU added specifications in labeling and established the Community Reference Laboratory, which made it all the more difficult for companies to trade in GM products. The addition of National Reference Laboratories in 2006 would have added the load of further investigation and expenditure, thus adding more burdens on the companies.

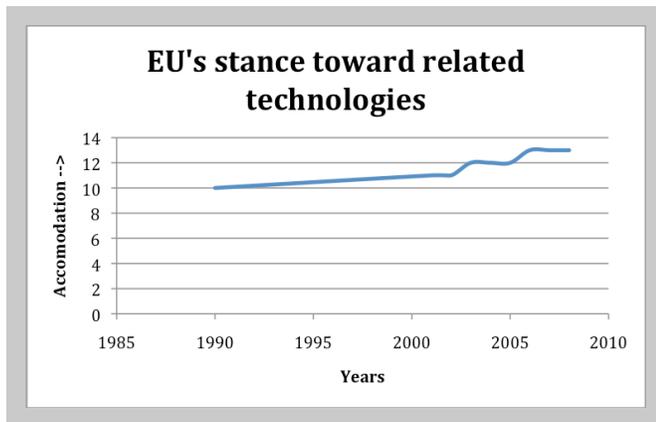
Understanding of the Technology. In sharp contrast to the stance reflected toward producers/traders, the legislation shows a rise in the implementation of related technologies for public safety. Compared to 1990, the 2001 Legislation (Article 4) highlights “traceability”

mechanism by which every stage of gene modification in a product can be identified. The 2002, 2003 & 2006 Regulations talk about the establishment of scientific bodies such as

European Food Safety Authority

and the Community Reference Laboratories. The 2004 legislation introduced the concept “unique identifiers” for tracing the stages of gene modification. By introducing new scientific concepts and scientific bodies, EU was adopting the related technologies that were meant for providing public safety on this issue.

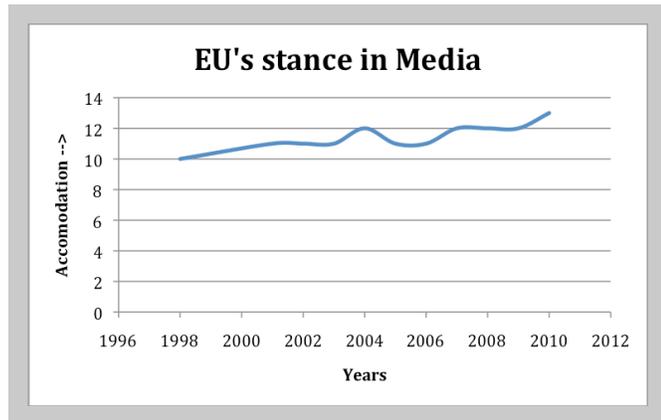
Graph 6.



Media

The stories in The “New York Times” and “The Times” reflect a complex set of stances within EU. The scientific body of EU “European Food Safety Authority (EFSA)” showed favorable stance on selected products. Some EU ministers/officials remained completely against GM products,

Graph 7.



while others became favorable owing to the rising prices of conventional food and due to international pressures. Amidst this set of stances, an overall official opinion can be traced if one focuses on - the statements of ministers and officials, editorial comments on EU regulations, and approval of the GM products.

In 2001 reports, the statements of EU officials clearly show that EU was in favor of breaking the moratorium of 1998. The stories in 2002 and 2003 however reveal that even though EU was interested in opening up, it was still reluctant in approving any GM product partly because of the pressure from the ministers and partly because of the scientific reports. Reportedly, it also passed a harsh legislation in 2003. Then in 2004, amidst stiff opposition it approved GM products in 2004, showing the favorable movement.

In 2005 and 2006 it showed reluctance in approving the crops and passed another harsh regulation. In 2007 the debate on GM “amflora” potato clearly show the growing

favorable opinion within EU. Finally in 2009-10, EU approved new GM products and the statements of the officials show its continued softening stance.

An overview of stances from different sources

By summarizing all the sources, one finds:

- (a) The opinion of general public was evenly divided, however the number of those who were in favor declined since 1996 until 2005 and remained constant after that.
- (b) The area under cultivation of crops has increased with occasional declines showing a positive stance of the producers.
- (c) The legislation was lenient in 1990 however it has become harsher for companies/producers every year starting from 2001 until 2006.
- (d) The stance toward introduction of new ideas on gene modification technology related to public safety, showed a positive movement.
- (e) Media reflected inconsistent movement of EU's stance over the study period.

Theoretical Perspective

The study was based on a combined model that emerged by mixing contingency theory with diffusion of innovations. The combined model assumed – the components or requirement of innovations may sometimes come in conflict with adopters, and the adopters take a stance, which is dynamic and moves on a continuum depending upon internal and external factors. The findings revealed that gene modification controversy in EU fitted with the model.

According to Cameron, Wilcox, Reber and Shin (2008), the stance of the organization is dynamic and changes as the events unfold. The findings from all the sources (public opinion, legislation, crop production and the media) confirmed that EU's stance changed as the events unfolded. Interestingly the legislation showed a pair of stances. The stance over selling or production of genetically modified food moved slowly toward advocacy, while the stance toward the technology (to provide safety) moved toward accommodation.

The newspaper reports showed that EU's conflict in the initial period consisted of issues that were indifferent toward realities; a kind of "luxurious debate." This is reflected in the stories related to starvation in Uganda. Reportedly, Uganda was starving however it refused to accept aid that was in form of genetically modified food because of EU's influence. In later years, however EU's stance became more realistic with the recommendations of scientific bodies and the rising prices.

According to Cancel, Mitrook and Cameron (1999), the stance of an entity is affected by internal and external factors. The findings confirmed that various internal and external factors affected the stance of EU. By "internal factors" the study considers all the factors that originated within EU while "external factors" are those that originated and affected from outside (rest of the world). The internal factors such as ethical and religious concerns pulled the stance toward advocacy while external factors such as international pressure and international trade competition, pulled the stance toward accommodation.

The authors (Cancel, Mitrook & Cameron, 1999) have also postulated subgroups of contingent variables (p. 195). The results of this study reveal that some of the factors did fall in those subgroups. One of the subgroups “government regulation” refers to the laws of the country in which the organization exists. In case of EU, the issue has to be looked at from the world’s perspective. Looking from that angle the embargo by World Trade Organization seems to be similar to the “government regulation.” Though WTO is not a government body in strict sense, but many countries respect it and they strictly follow its trade rules and therefore, in a way the trade embargo by WTO can be considered to have played the role of government regulation in influencing the stance of EU. Another subgroup “External Public” also seems to fit in the gene controversy. The countries opposing EU, which comprised of the United States, Argentina and others, can be considered to constitute the external publics. The size and the strength of these countries especially United States, and the stakes everyone had on this issue, did have a strong impact on the decisions of the EU on approving GM crops or reducing harshness in regulation.

The subgroup of “individual characteristic” got reflected through the EU officials who tried to diplomatically solve this deadlock. The stories published in the newspapers show that European Union Commissioner for Health and Consumer Affairs, John Dalli, tried to solve this deadlock by approving GM food in spite of strict opposition from EU ministers. Through the web reports one can trace a rough biography of John Dalli. It is interesting to note that John Dalli was related to ministry of industries, ministry foreign affairs for investment promotion in Malta, and also director of glass manufacturing

company in Libya. All these indicate his inclination toward economic promotion and market orientations, as opposed to the traditional and political inclinations of other ministers.

Another interesting finding was that the *significance* of the factors increased/decreased over a period of time in relation to each other. For instance during the period of 1998-2001 public opinion seems to have played the most important role in shaping EU's stance. However after a scientific body was created in 2002, opinion of the scientific body became comparable to public protests. Similarly, the international pressure became very significant from 2001 onwards and could be considered to be the leading factor in breaking the moratorium of EU. Later, rising prices started playing a significant role in influencing the decision of EU. It would be rather difficult to exactly pinpoint and compare the intensity of these factors through qualitative methods; a quantitative study may be more suitable in this regard.

Another interesting finding was the *interaction* of the factors among themselves. In the study, one notices that public protests declined over a period of time. This decline could be related to the rise in scientific research studies done within EU and outside, and also on the rise in prices of non-GM food and feed products. Additionally, some reports on GM animal products published in The New York Times in 2008 such as "Food From Cloned Animals Seems Safe, a Panel Finds" published on January 12 and "Europe Fails to Endorse Milk and Meat from Clones" published on July 25; clearly indicate that sometimes the scientific body backtracked from its opinion owing to ethical pressures.

In addition to these, one also finds an impact of international pressure and rising prices on the individual initiatives of the EU officers.

According to Rogers (1995) there are five categories of adopters: innovators, early adopters, early majority, late majority and the laggards. By examining the GM crop production and consumption, United States can be categorized as innovators, Argentina, Canada and Brazil can be categorized as early adopters, while countries such as China can be considered to be early majority; European Union seems to fall in the category of laggards. Nevertheless within EU, the member countries fall in different categories. For instance, Spain can be categorized as early majority while United Kingdom as late majority and France and Greece could be the laggards. This finding is based on public opinion, cultivation of GM crops and the statements given by the ministers of different countries.

The study also shows that EU was acting as an “opinion leader” for other countries on this issue. The stories such as “Between Famine and Politics Zambians Starve” and “Zambian Leader Defends Ban on Genetically Altered Foods,” published on August 30 and September 4, 2002, The New York Times, showed that EU’s strict posture was inspiring other countries to maintain moratorium on GMOs.

Limitations & Scope

The study was based on EU surveys, legislation and media stories. Perhaps it also required interviews of EU officials and seed company representatives. The interviews could have helped in adding weight to the analysis and also in constructing a combined

stance of EU. It could also have helped in identifying new factors that may have affected the stance.

The study proved that contingency factors come into play when innovations diffuse among the adopters. More such studies with different innovations and adopters would help in examining how the combined model fares in different settings. For instance, a quantitative study can be done on the adoption of Electronic Health Records (EHR) among the health care providers in the United States. The health care providers are adopting the prescribed objectives of EHR at different stages to attain the “Meaningful Use” status. It would be interesting to see how contingency factors come into play at each of these stages. A study with similar approach can also be done on common innovations like Internet, cell-phones, etc.

Future studies can also provide more depth on some questions that were merely discussed in the study. For instance - do all the factors affecting adopters fit in the sub groups of contingency variables or do we need some more sub groups? Which variables are strong and which ones are weak; can we construct a scale on that basis; do the same variables become strong at a point in time and weak at the other? Do variables interact with each other and how does this interaction affect organization’s stance? Can we relate intensity of conflict with the number of innovations in technology cluster?

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