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Environmental Management Standards and Globalization

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Abstract

ISO 14001, released in 1996, provides the basic framework for the establishment of an Environmental Management System (EMS) that can be audited and can lead to certification. ISO is not only an acronym for the International Organization for Standardization but is also a term that refers to its Greek meaning: "equal." The main rationale for the creation of ISO 14001 was that its worldwide acceptance should expedite international trade by harmonizing otherwise diffuse environmental management standards and by providing an internationally accepted blueprint for sustainable development, pollution prevention, and compliance assurance. However, the implementation of ISO 14001 varies significantly across the globe. In 1998, 52.4% of the 7,887 ISO 14001 certified facilities were located in Western Europe and 37% in Asia. On the contrary, American companies, although ahead in many areas of environmental management, seem reluctant to adopt this voluntary standard. U.S. certified facilities accounted for only 3.7% of the total of ISO 14001 certified facilities in the world in 1998. This paper looks at the institutional and organizational factors at well as the market incentives that might facilitate or hinder the adoption of an EMS standard such as ISO 14001 in Europe and in the United States. The analysis is supported by primary data collected from a phone questionnaire to 140 firms in Europe and a questionnaire mailed to 55 firms in the U.S.

KEYWORDS:

I. INTRODUCTION

ISO 14001, released in 1996, is an Environmental Management System (EMS) that can be audited and certified. The development of ISO 14001 as an international standard for EMS is a clear consequence of globalization. The main rationale for the creation of ISO 14001 was that its worldwide acceptance should expedite international trade by harmonizing otherwise diffuse environmental management standards and by providing an internationally accepted blueprint for sustainable development, pollution prevention, and compliance assurance. ISO 14001 is therefore an example of the trading-up hypothesis where market forces are the drivers of increased environmental standards. This chapter analyzes the mechanisms of diffusion of ISO 14001 in Europe and in the United States.

ISO 14001 is an example of procedural harmonized standards where all nations should adopt similar environmental management systems and procedures. However the level of implementation of ISO 14001 differs across countries. In 1998, 52.4% of the 7,887 ISO 14001 certified facilities located in Western Europe and 37% in Asia. On the contrary, American companies, although ahead in many areas of environmental management, seem reluctant to adopt this voluntary standard. U.S. certified facilities accounted for only 3.7% of the total of ISO 14001 certified facilities in the world in 1998 (see Table 1).

ISO 14001 represents a case of a strict standard harmonization with continued divergence in the effectiveness of its implementation. I argue that the main factor that hampers the global diffusion of ISO 14001 is the persistence of national policy divergence in an increasingly globalized economy. This paper analyzes the economic, institutional and normative mechanisms that facilitate or hamper the global diffusion of ISO 14001. It describes in details the role that such factors play in the specific U.S. and European context.

An Environmental management system (EMS) is one of the tools, which organizations can use to voluntary implement environmental policy. It consists of "a number of interrelated elements that function together to help a company manage, measure, and improve the environmental aspects of its operations."[1] However if each company designs its own system to meet its own particular needs, one can see that the resulting systems might differ widely among firms making it difficult to compare their results. To cope with this problem, industry associations have developed codes of practices and some countries have adopted national EMSs.[2] However, without a common international standard, companies would be forced to deal with dozens of separate and potentially incompatible EMSs for every country where they conduct business. This could potentially increase their cost and impose trade barriers.

The ISO 14001 series environmental management systems standards was introduced on the coattails of the success of ISO 9000, which is the series of quality management system standards. ISO 9000 has become a de facto requirement for doing business in many industries.[3] The total number of certifications worldwide has passed 250,000 in 1999. ISO 14001 was created with the idea that it would also become a prerequisite for firms to conduct their business globally.

However, it is not clear how far the internationalization of standardized environmental management systems can go as specific cultural, institutional and organizational issues

Table 1. ISO 14001 certified facilities worldwide

Region	Country	Certified facilities	% total
Western Europe		4136	52.4
	UK	921	11.7
	Austria	132	45.4
	Denmark	314	218.1
	Finland	206	70.8
	France	295	204.9
	Germany	651	8.3
	Ireland	96	33.0
	Italy	123	85.4
	Netherlands	341	4.3
	Spain	164	2.1
	Sweden	304	3.9
	Switzerland	360	4.6
	Other	229	2.9
Asia-Pacific		2917	37.0
	Japan	1542	19.6
	Korea	263	3.3
	Taiwan	203	2.6
	Autralia	352	4.5
	Other	557	7.1
North America		434	5.5
	Canada	104	1.3
	USA	291	3.7
	Mexico	39	0.5
Latin America		144	1.8
Africa/West Africa		138	1.7
Central and Eastern Europe		118	1.5
Total		7887	100.0

Source: International Standard Organization

might hamper the global diffusion of such a standard. These concerns might be more acute for environmental standards as firms might identify regulatory violations during the implementation of the environmental certification. The adoption of the standard might thus be associated with high transaction costs if regulatory agencies were to use such information against firms.

ISO 14001 is voluntary but not free and firms will invest in ISO 14001 if they perceive that it enhances their environmental performance as well as facilitate their business in specific markets. In this chapter, I analyze the characteristics of the institutional environment that favor or discourage the adoption of ISO 14001. I argue that the standard will be adopted in context where regulatory agencies along with stakeholders push for its development. When regulatory agencies provide some guidance for its adoption as well

as show some regulatory flexibility to adopting firms, there are more incentives to adoption than in context where regulatory agencies pay little attention to the standard or when there are potential liabilities issues linked to the adoption of ISO 14001. Furthermore, firms will have higher incentives to adopt in context where stakeholders such as distributors, customers, and insurance companies recognize the value of the standard.

European companies benefited from a strong regulatory commitment through the Environmental and Management Eco-Audit Scheme (EMAS) which was a regulation issued by the European Commission to favor the development of a European Environmental Management Standard. This regulatory push favored the development of competencies and environmental resources that privileged the development of environmental management practices among European companies. The analysis is based on a telephone survey of European firms that was conducted for the EMAS assessment by the European Commission.

In contrast American companies, although ahead in many areas of environmental management, seem reluctant to adopt this voluntary standard. This could be linked to American Institutional factors that might impede the diffusion of ISO 14001 in the United States. The analysis is supported by primary data collected from a questionnaire mailed to a representative sample of ISO 14001 certified facilities in the United States.

II. ISO TO REDUCE NON-TARIFF TRADE BARRIERS?

Since 1990 there have been efforts at the national level, within the European Union and at the international level to standardize EMSs by defining the essential elements which such a system should contain. EMS standards such as the British Standard BS 7750 [4], the European Union (EU) Eco-Management and Audit Scheme (EMAS)[5] have been developed to provide organizations with a standardized framework that would allow them to implement an EMS. The international standard ISO 14001 issued in 1996 is more ambitious as it is intended to remove non-tariff barriers to trade linked to environmental practices and to level the international playing field in terms of EMS standard. The development of the ISO 14000 Series was stimulated by two important agreements: the Rio Agreement (1992) and the GATT Uruguay Round Ministerial Decision on Trade and the Environment (1994).

The Global Environmental Initiative in Rio de Janeiro in 1992 was an essential step in the formation of ISO 14000.[6] Over one hundred of the countries attending the United Nations Conference on Environment and Development (UNCED) committed to improving international environmental management programs and petitioned the International Standardization Organization to adpt this cause.

The Uruguay Round Ministerial Decision on Trade and the Environment established a committee in 1994 under the World Trade Organization (WTO) to harmonize environmental and trade policy based on two key factors: (i)"identifying trade and environmental policy linkages to promote sustainable development" and (ii)"avoiding protectionist measures while promoting [the] environmental objective agreed to at the [UNCED]".[7]

On the heels of ISO 9000's success, [8] the International Standard Organization (ISO) [9] responded to the demands to address the field of environmental law and pollution. ISO responded by establishing the Strategic Advisory Group on the Environment (SAGE) to determine whether an international environmental management standard could "promote a common approach to environmental management, enhance an organization's ability to attain and measure improvements in environmental performance, and facilitate trade and remove trade barriers." [10] SAGE assessed the need for an international EMS standard that would encourage responsible environmental management without violating GATT. As a result, Technical Committee 207 (TC 207) was formed in 1993 to develop the ISO 14000 Series.

In September 1996, ISO issued the first edition of the ISO 14000 Series, a set of guidelines for developing systems and practices in six environmental sectors. The Series was divided into six sections, each containing one or more standards:

-ISO standards 14001 and 14004 - Environmental Management Systems

-ISO standards 14010 to 14012 - Environmental Auditing

-ISO standards 14020 to 14025 - Environmental Labeling

-ISO standard 14031 - Environmental Performance Evaluation

-ISO standards 14040 to 14043 - Life Cycle Assessment

-ISO standard 14060 - Environmental Aspects in Product Standards

The first and only edition that was published in 1996 focused on the EMS standard ISO 14001 and the Environmental Auditing standards (ISO 14010 – 14012)[11].

ISO 14001 is the only certifiable standard in the ISO 14000 Series. All other standards in the Series describe supporting functions, which serve to maximize the effectiveness of the ISO 14001 EMS. However, the implementation of these supporting standards is not required for ISO 14001 certification.

There are five requirements of ISO 14001: formation of a corporate environmental policy and commitment to an EMS, development of a plan for implementation, implementation and operation of the EMS, monitoring and possible corrective action, and top management review and continual improvement.

Worldwide acceptance and incorporation of ISO 14001 should expedite international trade by harmonizing otherwise diffuse environmental management standards and by providing an internationally accepted blueprint for sustainable development, pollution prevention, and compliance assurance. However, if ISO 14001 is implemented unevenly across countries, there is a danger that ISO 14001 may itself serve as a barrier to trade, especially if it promotes preferential selection of certified companies over non-certified ones.

III. WHICH INSTITUTIONAL ENVIRONMENT IS APPROPRIATE FOR ISO 14001?

The institutional environment is an essential influencing factor for firms, as it creates not only the rules of the game but also the market for environmental products and services. [12]

ISO 14001 requires firms to provide information to the certification body that they may consider as 'sensitive'. Once the firm has disclosed this information to the certification body, it cannot take it back. Furthermore, ISO 14001 certification can have potential legal consequences in terms of confidentiality and discoverability. Indeed, the development of the written EMS documentation, identification of regulatory compliance requirements and third party access to sensitive materials, might have legal impacts.

The legal issue that many companies struggle with, and that in some cases could discourage them from implementing ISO 14001, is the potential discovery of regulatory violations that firms had not yet identified or resolved. ISO 14001 inadvertently leads to the discovery of non-compliance with applicable environmental regulations. While compliance with environmental laws and regulations should theoretically be considered a benefit of implementing ISO 14001, the identification of violations during the implementation phase or self - or third party audits can lead to potential liabilities. The violated regulations may involve strict liability (intent or negligence need not be shown) and/or the duty to disclose violations. [13]

Another potential risk of legal liability is that ISO 14001 requires companies to document the details of environmental aspects of their operations that are not related to regulatory compliance in order to track the effectiveness of the system. Audits conducted under ISO 14001 check these documents and may point out weaknesses in the company's handling of environmental matters such as records of system failures and minor spills. These findings, while they may not be governed by any regulations might still be used in legal proceedings as incriminating evidence. Thus, if a company adopts an EMS with a written policy statement on environmental matters which specified targets and objectives, it may also be defining a standard under which it may be held accountable.[14]

IV. ISO 14001 AND THE SEARCH FOR A COMPETITIVE ADVANTAGE

An EMS standard like ISO 14001 can be identified as an intangible resource or a capability since it refers to the organization's set of skills linked to environmental management.[15] The ability to integrate the natural environment into the strategic planning process could potentially offers a firm the opportunity to develop a valuable capability that could be transformed into a competitive advantage. [16]

At present if is not clear how firms can create value by adopting ISO 14001. The standard itself is an intangible resource or capability and can be regarded as more a process standard than a product standard. ISO 14001 certification is therefore not a label that would signal to the market how a product has been produced with environmental sensitivity. [17] This discussion is complicated by the fact that consumers might not identify or understand the advantages of ISO 14001, as the standard does not provide any real measure of environmental performance. Although ISO 14001 requires an organization to measure and track its environmental performance, there are no adopted or commonly accepted Environmental Performance Indicators. Section 4.5.1 of ISO 14001 requires an organization to have procedures to "monitor and measure, on a regular basis, the key characteristics of its operations and activities that can have a significant impact on the environment" as part of the checking and corrective action portion of its EMS. [18] Furthermore, the standard does not establish absolute requirements for environmental

performance other than a commitment to compliance with applicable regulations, and it does not identify environmental performance as a factor in the actual certification process.

Due to this lack of definition of precise environmental variables for monitoring purposes, the resulting data may not provide companies, policy-makers, and the public with accurate information they can use to make comparative judgements about organizational environmental performance issues. It is therefore very difficult for consumers to put a value on this resource.

If not a direct signal to customers, ISO 14001 could also signal to other stakeholders such as investors that the management of a certified firm is environmentally sound. The expanding nature of environmental risks and liabilities has led investment and insurance groups to require more thoughtful environmental analysis in the preparatory stages of a transaction. Companies with pollution prevention programs and EMSs like ISO 14001 should be far more attractive risks to insurance underwriters and could gain better rates. However, the difficulty in assessing environmental performance might also be a problem for these stakeholders since they lack tangible elements on which to base their analysis of a firm's environmental performance.

If ISO 14001 is adopted by many firms in one market, and if firms require their suppliers to be ISO 14001 certified, it is clear that the standard will become a requirement for any and all firms wishing to access this market. Certification will function as a barrier hampering a non-certified firm's entry into the market. For example, the large diffusion of environmental management standards such as BS 5570 or EMAS in some sectors of European countries might be a real obstacle to the entry of foreign firms into the European market. Since ISO 14001 is supposed to be applicable on a global scale, it seems obvious that firms wishing to enter such a market would have incentives to obtain ISO 14001 certification.

Although ISO 14001 is open to any company that wishes to invest in obtaining the certification, there is a learning experience curve at the sector or even institutional level that might facilitate the adoption of the certification. It is thus easier for a firm in a particular industry to obtain certification in an environment where other firms in that same industry have already been certified. Since the standard does not offer much guidance, it is important that firms be able to benefit from the experience of other firms in the same sector or from consulting companies which have a proven experience of certification in that sector. In an environment where many firms within the same industry have been certified, the development of knowledgeable consulting companies will be useful for firms in search of certification. In such a context, a certification organization might also be available. ISO 14001 might therefore be a resource difficult to acquire for those firms, which do not benefit from an environment where other similar firms have already had experience with the certification procedure. ISO 14001 is clearly derived from ISO 9000, which is the standard for total quality management. Firms that know how to deal with ISO 9000 should be more inclined to obtain ISO 14001 certification.

In particular, since the standard does not present "tangible" results regarding improvement of a firm's environmental performance, it is necessary that all stakeholders believe in the benefits of ISO 14001 standardization and make a commitment to promote

it.[19] Only in this way can firms transform certification into a competitive advantage. Furthermore firms would be more likely to pursue certification if they belong to a sector where process manufacturing as well as pollution prevention are core components of business advantage.

It seems likely that firms would also pursue ISO 14001 certification if they were willing to enter countries where certification was a requirement. Certification would then be similar to, and would function as, a barrier to trade. ISO 14001 could provide a competitive advantage to firms within a given country since it is a resource that is difficult for firms located outside of the country to imitate.

V. THE DEVELOPMENT OF ISO 14001 IN EUROPE

The situation of Europe differs from the one in Asia and in the United States as ISO 14001 could grow on the ground of existing Environmental Management Standards (EMSs). The British BS 7750 and the European EMAS were the first EMSs implemented in the world. This provided Europe with a lead advantage and some experience to build on when ISO 14001 was put into place. Furthermore, EMAS, the European standard developed by the European Commission benefited from a strong support by European authorities that promoted his diffusion into European firms. These two elements, experience and regulatory promotion of the standard would provide a favorable ground to the development of ISO 14001 in Europe by limiting transaction costs associated with the adoption of the standard and favoring the development of potential firm level competitive advantage.

In the course of the assessment of the implementation of EMAS in 1997, a survey was conducted with competent bodies, accreditation bodies, accreditation environmental verifiers (AEV) and EMAS registered sites in the 15 Member States.[20] This part builds on the results of the survey. I first explain how the institutional environment showed credible commitment to the promotion of the standard therefore reducing the costs of acquiring the standard. Second, I show how EMAS and BS 7750 provided the enough past experience on which European firms could build to facilitate their certification process.

The threat of a mandatory EMS

It is in the UK, in 1992, that the world's first environmental standard -BS 7750- was published in March 1992. The standard was subjected to a 2-year pilot implementation program involving almost 500 participants, and was modified on the basis of the feedback obtained from the program. The modified standard was published in January 1994.

At the same time that the British Standard Institute (BSI) began work on BS 7750, the European Commission was setting out its proposal for an eco-audit scheme: the Environmental Management and Audit Scheme (EMAS). EMAS was adopted by the Council of Ministers on June 29, 1993. [21] Because EMAS is a regulation, rather than a directive, it immediately binds all EU Member States. [22]

The European Commission originally intended to pursue mandatory participation but business lobbying successfully prevented this. The European Commission did, however,

retain the right to adopt compulsory registration in future, adding power to the legislative impetus towards environmental audit.[23] The European Commission also at first required an annual auditing which was changed to a requirement that the audit will be executed at intervals no longer than three years.

The EMAS regulation requires the European Commission to review the progress of the EMAS no more than five years after adoption. Because the original EMAS proposal contemplated a mandatory scheme, the scheduled renewal in 1999 could result in a mandatory scheme.

The perceived threat of EMAS becoming a mandatory scheme was also intensified by the choice of "competent certification bodies" that could be linked to Member States environmental ministries. For example, in France the choice of competent body has been the cause of much anxiety in industry with the close link between the inspection authority (regulator) and competent body leading to concern over possible increased control of industrial sites, which in turn has raised the issue of the voluntary nature of EMAS. Therefore in France EMAS was perceived as a first step to a mandatory standard.

The important difference between EMAS and BS 7750 is that the later does not have the former's commitment to the publication of audit findings regarding environmental performance, a disclosure with which companies are often uncomfortable. It has been suggested that BS 7750 would serve to introduce companies to the techniques, allowing them to cut their teeth on the less publicly scrutinized standards of BS 7750 before moving on to EMAS. The similarity between the two schemes should therefore encourage companies to set up an environmental management system and assess their progress before taking the key step to publication of performance.[24]

The early availability of competing national environmental management standards such as BS7750 (which were withdrawn and replaced by ISO 14001 in countries such as the UK) when the EMAS scheme was launched April 1995 is one factor contributing to the current success of ISO 14001.

In brief, in Europe, firms could have been adopting ISO 14001 under the pressure that the European Commission would issue a mandatory environmental management scheme with environmental performance measures. In addition, EMSs in Europe benefited from a strong promotion by competent bodies, which were also granted some regulatory flexibility to EMSs' certified companies.

Promotion of EMAS and regulatory flexibility

According to interviews of EMAS competent bodies conducted in 1997, there have been several measures to inform companies of the requirements of EMAS. Conferences, seminar, brochures, and guidelines were the methods most frequently used by Member States to inform companies of the requirements of EMAS.[25] Six Member States could quantify the financial budget allocated to promote the participation of small and medium companies. The amount was of ECU 35.1 million since 1995 (approximately $34 millions).[26]

Furthermore, in some Member States regulatory flexibility was granted to EMAS certified firms. For example, German authorities have begun to ease administrative

enforcement requirements on EMAS certified sites. In the heavily regulated German Länd of Bavaria many industrial sites sought EMAS registration after it was indicated that the environmental regulatory regime would be reduced for EMAS registered sites, this in fact has yet to happen. Within Germany, a political decision was also made to try and keep the competent body for the scheme as close as possible to business. The result was that rather than having one centralized competent body, 44 Chambers of Industry and Commerce and 21 Chambers of Skilled Craftsman were designated as EMAS competent bodies.

In conclusion, in Europe, EMAS was granted a high regulatory credibility and flexibility. Under the threat of a potential mandatory EMAS, firms could use ISO 14001 as a way to learn how to become EMAS certified. This was further facilitated by the increasing compatibility between EMAS and ISO 14001 that was implemented in the revision of EMAS in 1997.

Compatibility of EMAS and ISO 14001

As a result of the European Commission "Decisions on the recognition of ISO14001 and certification procedures for use with the EMAS Regulation", it is now possible for verifiers to avoid duplication of effort when firms seek both EMAS and ISO 14001 certifications. [27]

Although EMAS continues to differ from ISO 14001 in its depth and demand with regard to commitment, transparency and environmental performance, the structure of the environmental management system is to be analogous to the structure detailed in the ISO 14001 standard.

Already in 1997, of the 140 EMAS certified sites that were part of the above-mentioned survey, 47% were also ISO 14001 certified.[28] Only 15% of registered sites of small sized enterprises were not certified ISO 14001. Of the 66 registered sites certified ISO 14001, over a third (38%) had achieved ISO 14001 after EMAS verification and 36% at the same time as EMAS verification.[29] The majority (92%) of the 66 registered sites certified ISO 14001 had their ISO 14001 certification undertaken by the same organization that undertook their EMAS site's verification.[30]

Since there is a high correlation between EMAS and ISO 14001 certification it is valuable to use the results of the survey of EMAS certified facilities to understand the behavior of ISO 14001 certified facilities in Europe. We will look at several aspects of EMS certification. The first one refers to the time to get certification; the second one refers to stakeholder involvement and the third one to the competitive advantage gained through EMS certification.

Time to get EMS certification

EU regulatory credibility also favored the development of certification bodies or "verifiers" and also of the initiation of a market for consulting companies. These elements facilitated the ease of the adoption of EMAS and subsequently ISO 14001 for European firms. Indeed consulting firms knowing the commitment of the European Commission to promote the standard could invest in consulting services to help firms adopt the standard. This would then reduce firms' costs to get certification as they could rely on a market of

consulting firms. In 1997, 254 verifiers have been accredited in 10 Members States, of which 72 (28%) are organizations (as opposed to individuals). Out of the 72 organizations verifiers, 57 (79%) are also certifiers to ISO 14001.[31]

It is however difficult to assess the real cost for EMAS facilities to get certification. The only measures we could gather concern the time firms take to get EMAS certification. 64% of registered sites with EMAS take more than 10 months to implement EMAS.[32] The elements of the certification process that took the most time were the "environmental management system" (39%) and the "environmental review" (29%).[33] Firms that were seeking EMAS and ISO 14001 certification conjointly would take more time to get EMAS certification than firms that were seeking EMAS certification only. However this decreased for the year 1997 with the implementation of the recognition of ISO 14001 in EMAS certification procedures.

Stakeholder involvement

EMAS has more obligations than ISO 14001. It requires firms to provide an "Environmental Statement" that can be disclosed to the public. The Environmental statement is widely distributed. The majority of all registered sites (88%) distribute over 100 and 499 copies of their environmental statement.[34] This figure increases to 94% for large sized enterprises. 45% of all registered sites have had more than 100 of their environmental statement specifically requested. Therefore unlike ISO 14001, EMAS encompasses a public document on the environmental performance of the firm. Firms can use this as a tool to promote their environmental management to stakeholder.

Indeed, all registered sites viewed customers (60%) and the local community to the site (44%) as the main audiences for their sites environmental statement.[35] 60% of all registered sites viewed the environmental statement as a useful communication tool with their stakeholders. [36]

There is therefore a difference between ISO 14001 and EMAS in terms of measurement and diffusion of environmental performance. Firms can use the Environmental Statement to communicate with stakeholders on their environmental policy.

Competitive advantage

In Europe, the European Commission and Member States Ministries promoted EMSs. It is therefore interesting to see how the “market” for environmental standard developed. The survey of EMAS certified facilities provides some responses on how firms perceive the advantages of EMAS. The top three benefits cited by all registered sites were "cost savings" (31%), "better image" (29%) and "improved employee moral" (26%).[37] "Competitive advantage" would be important for only 11% of certified facilities at the same level of “assured regulatory compliance” (11%). In addition to an efficiency rationale, EU firms are seeking to establish good relationships with their stakeholders rather than just seeking a competitive advantage.

In conclusion, European firms responded to a regulatory pressure that favored the development of an Environmental Management Standard. The European institutional environment reduced the potential search and information costs linked to EMAS certification. Furthermore, it facilitated the development of a certification system with

"verifiers" and consulting companies. This eased the certification process. Furthermore EMAS with its required "environmental statement" provided a clear and positive signal to stakeholders concerning firms' commitment to improvements in environmental performance. Firms could then use EMAS as a communication tool to improve their relations with stakeholders.

Since ISO 14001 is easier to implement than EMAS, it might be perceived as a good way to get prepared to a potential “mandatory” environmental management standard that could be installed by the European Commission. Furthermore, ISO 14001 with its international dimension provides also economies of scale and may facilitate market entry for multinational companies. Therefore, in Europe, firms could perceive that the benefits of getting ISO 14001 would outweigh its transaction costs.

VI. FIRMS' INCENTIVES TO OBTAIN CERTIFICATION IN THE U.S.

The case of the United States differs strongly from the European one, as there was no previous environmental management standard in place previous to ISO 14001. The U.S. is marked by a very sophisticated command and control system of regulations in which ISO 14001 has difficulty to find a place. Furthermore the adversarial culture between the industry and the regulatory agency does not favor the development of collaborative regulatory schemes.

The number of U.S. certified facilities is low compared to European countries. With 291 certified facilities representing 90 firms in 1998, the United States lagged behind 9 other countries (United Kingdom, Germany, Sweden, Netherlands, Switzerland, Denmark, Japan, France, Australia) (See Table 1.). Within the U.S., many ISO 14001 certification decisions were made by non-U.S. firms. 30.8% of certified firms had their headquarters outside the United States. Of the foreign multinationals that had certified their facilities, the largest percentages were from Japan (19.2%) and the European Union (9.6%).[38] This raises the question of whether there are specific characteristics of the U.S. environment that deter U.S. firms from seeking certification.

To evaluate the drivers and barriers to the implementation of ISO 14001 in the United States, a questionnaire was mailed to 152 U.S. certified companies. Of the 152 questionnaires mailed, a total of 55 responses were received by February 15th, 1999. The responses represent 36% of those surveyed, as well as over 30% of the 200 U.S. ISO 14001 certified firms identified in the Globus International Database as of November 1998. [39] The questionnaire asked managers to state the importance of several factors that led to their decision to become ISO 14001 certified. Two of the questions from the survey were selected for analysis in this chapter. The first question concerns the incentives for a firm to adopt ISO 14001. The second question pertains to the constraints associated with the implementation of ISO 14001 certification.

ISO 14001 and the U.S. institutional environment

Concerning the regulatory framework either favoring or discouraging the adoption of ISO 14001, the variables considered in the survey were: “greater permit flexibility,” “revised approach to regulatory inspections,” “fewer regulatory fines,” and “decreased permit costs.” These variables were rated from not important (1) to very important (5). A high

majority of firms did not consider these factors to be important incentives to their decision to become ISO 14001 certified. More than seventy-six percent (76%) of the firms in our sample considered "greater permit flexibility" not to be a very important factor in their decision to apply for ISO 14001 certification. Likewise, seventy seven percent (77%) of the firms said that "revised approach to regulation inspections" was not very important; seventy six percent (76%) said the same for "greater permit flexibility"; seventy three percent (73%) for "fewer regulatory fines"; and eighty five percent (85%) for "decreased permit costs" (see Table 2.). According to this survey, it seems clear that the institutional set-up does not provide any incentive for U.S. firms to adopt the standard. In fact, the institutional set-up seems a constraint that hampers firms from adopting the standard.

Table 2. Incentives to ISO Certification

	Not important to important (1-3) %	Quite important to very important (4-5) %
Improved management of environmental impacts	28	72
Public demonstration of environmental stewardship	34	66
Reduced pollution	38	62
Reduced environmental risk	38	62
Increased competitive advantage	38	62
Improved compliance with government regulations	45	55
Greater market share	46	54
Improved regulatory compliance	49	51
Increased international trade opportunities	49	51
Improved internal communication among managers	53	47
Access to new markets	57	43
Marketing/Advertising opportunity	57	43
Communication with the community	60	40
Increased shareholder value	64	36
Customer requirement	68	32
Fewer regulatory fines	73	27
Greater permit flexibility	76	24
Revised approach to regulatory inspections	77	23
Decreased insurance costs	85	15
Decreased permit costs	85	15
Greater access to capital	87	13
Buyer requirement	90	10
Lender requirement	94	6
Valid N (list) 53 observations		

In contrast, the variables which represent regulatory constraints, "uncertainty with regulatory agencies', utilization of EMS audit information", and "potential legal penalties from voluntary disclosure", are considered to be important by firms. The five-point scale ranged from "not a constraint" (1) to "a very serious constraint" (5). Sixty two percent (62%) of surveyed firms considered "uncertainty with regulatory agencies' utilization of EMS audit information" to be a constraint. Likewise, sixty percent (60%) indicated that the "potential legal penalties from voluntary disclosure" and sixty nine percent (69%) that the "lack of regulatory flexibility" were also a constraint (see Table 3.).

Table 3. Constraints to the adoption of ISO 14001

	Mild to serious constraint (1-4) %	Not a constraint (5) %
Lack of top management support	77	23
Design costs of ISO 14001 EMS	75	25
Lack of regulatory flexibility	69	31
Registration costs	67	33
Lack of understanding of ISO requirements	67	33
Annual costs of maintaining an ISO 14001 EMS	67	33
Lack of time to implement a quality EMS	65	35
Uncertainty with regulatory agencies' utilization of EMS audit information	62	38
Potential legal penalties from voluntary disclosure	60	40
Lack of personnel to implement/manage EMS	58	42
Valid N (list) 52 observations		

ISO 14001 and the search for a competitive Advantage

It is clear from the survey that, in the U.S. at least, whether or not ISO 14001 is adopted, is not related to stakeholders' requirements. A vast majority of firms considered various stakeholders as non-important incentives in seeking certification: "increased shareholder value" accounting for sixty four percent (64%); "customer requirement" accounting for sixty-eight percent (68%); "buyer requirement" accounting for ninety-percent (90%); and "lender requirement" accounting for ninety-four percent (94%) (See Table 2.). Very few U.S. companies at present require that their suppliers be ISO 14001 certified. IBM is one of the few in this case which might explain the high rate of certification in the electronics industry.[40]

According to the survey results, ISO 14001 certification is better used as a public demonstration of environmental stewardship. Sixty six percent (66%) of the firms in our sample consider "public demonstration of environmental stewardship" as an important reason to get ISO 14001 certification. However, "communication with community" and "marketing/advertising opportunity" are less important for firms as incentives in seeking

certification accounting for only forty percent (46%) and forty three percent (43%), respectively (See Table 2.)

One of the main incentives to get ISO 14001 originates from the need to access markets where ISO 14001 is a requirement. The variables representing the potential to gain a competitive advantage from the adoption of ISO 14001 are all considered by the majority of managers as important reasons to seek certification: "increased international trade opportunities" accounting for fifty one percent (51%), "increased competitive advantage" accounting for sixty two percent (62%), and "greater market share" accounting for fifty four percent (54%) (See Table 2.). These results indicate that firms believe that there is a positive link between the adoption of ISO 14000 and the gaining of business advantages.

In conclusion, our results show that:

- Firms that get certified are mostly multinationals with experience in dealing with management standards.

- Firms believe that the U.S. institutional set-up does not facilitate the adoption of ISO 14001 and might even be a constraint to its implementation.

- There is neither demand, nor involvement from U.S. stakeholders to push firms to adopt the standard. U.S.

- Managers do believe that the adoption of the ISO 14001 standard will improve their environmental performance. However, since U.S. stakeholders do not value the standard, it is mainly used to demonstrate environmental stewardship to the public and to increase trade opportunities.

VII. DISCUSSION

In a competitive market in which a contract loss due to non-compliance could irreparably damage the prestige and finances of a company, ISO 14001 offers an organized approach to managing environmental issues. Using this approach, a company can potentially cut environment-related costs and increase profits in a variety of ways.

However, the process of acquiring ISO 14001 certification might be costly if there is uncertainty about regulatory agency commitment to the standard. An EMS audit under ISO 14001 may reveal not only procedural defects, but also environmental performance problems including noncompliance with existing command and control regulations. If companies are required to disclose this information to appropriate enforcement authorities as part of the certification process, and if these authorities do not commit to interpreting these audits in a positive way, then there will be resulting transaction costs for certified companies. These additional costs are potentially a major obstacle to the initiation of ISO 14001 certification.

The European context seems to provide an appropriate ground for the development of EMS standards. The Institutional environment, the European Commission, has been at the origin of the development of EMAS in conjunction with industry. Cultural elements in Europe such as good quality relationship between regulatory agencies and industry have mitigated firms' fears of transaction costs linked to the adoption of the EMS certification.

The lack of cooperation between industry and regulatory agencies in the U.S. most likely accounts for the slow pace of adoption of ISO 14001. The standard stipulates that audit findings from internal or external audits be documented in a detailed written audit report. In the U.S. context, firms might fear that these audit reports would become the new "smoking gun" of environmental litigation. Indeed, it is not clear how corporations would be able to protect the confidentiality of audit reports and other documents solely through the attorney-client privilege and the attorney work product doctrine, which are the two traditional legal privileges that grant confidentiality.[41]

Furthermore the cost of designing and implementing an EMS might be high in an environment where there is little experience to build on within the industry as well as few consulting companies. We have described how the development of the certification scheme for EMAS in Europe favored such experience and facilitated the certification process for firms.

The experience of the firm in dealing with management standards is also important. The time and cost for implementing ISO 14001 depends on whether a site has a functioning ISO 9000 Quality Management System to build on, whether it has implemented Responsible Care (Pollution Prevention, Community Awareness and Emergency Response and Process Safety programs) and if it has systems in place to maintain compliance with state and federal regulations. European firms are well ahead their American counterparts in terms of the adoption of ISO 9000 standard. [42] This might also be one of the element explaining the difference between the two continents in the difficulty of the implementation of ISO 14001 in the U.S.

Although commitment to improved environmental performance and compliance with existing command and control regulations are prerequisites to ISO 14001 certification, the ISO 14001 standard does not provide any real measure of environmental performance. It is therefore difficult for stakeholders to assess the value of such a standard. Furthermore, since ISO 14001 is a process standard and is not linked to any eco-labeling standard, it does not send a clear signal to customers regarding a firm's environmental improvements. In addition, as the standard is not linked to any life cycle analysis it might not encourage a firm to actively research innovative and lucrative solutions to environmentally sensitive components of the production process. However, ISO 14001 is a resource that might allow a firm to penetrate foreign markets where EMS standards are already requirements.

The survey of U.S. certified firms supported these propositions. Firms seem to perceive that American regulatory institutions do not provide enough regulatory flexibility to allow the smooth development of ISO 14001. Stakeholder pressures to push the adoption of the standard are still weak. The data indicate that firms are using the certification more to increase trade opportunities than to obtain a competitive advantage within their own market. In conclusion, it is not clear in the United States whether the competitive advantage gained from the adoption of the ISO 14001 standard offsets its potential associated transaction costs.

This paper has compared the diffusion of ISO 14001 in Europe and in the United States. It would be very interesting to compare these cases to the Asian context in which the diffusion of ISO 14001 seems quite rapid. Like in Europe, Asian regulatory agencies

have actively pushed the development of ISO 14001. Many Asian countries have government funded ISO 14001 support programs already in place and some of them are hoping that in the long run, an ISO 14000 system will assist them in monitoring industry.[43]

VIII. CONCLUSION

Spearheaded by the International Organization for Standardization, with the participation of 50 of its 111 member nations, ISO 14001 is a voluntary environmental management and procedural standard. However the implementation of ISO 14001 is not even between countries as there is continual divergence in the effectiveness of its implementation. This paper has described the economic, institutional and normative mechanisms that are favoring or discouraging the diffusion of ISO 14001 in specific national contexts.

Since ISO 14001 is voluntary, firms will seek certification if the potential transaction costs of acquiring the certification are offset by the advantages the certification will ultimately provide to the firm. This chapter has analyzed how a specific institutional context can impact firm's incentives to adopt an EMS standard. The role of regulatory agencies is key to reduce the costs that are linked to firms seeking certification. I have shown how European governments have been providing assistance to firms seeking certification. Furthermore, since the standard does not present tangible results of actual improvement of environmental performance to a firm's stakeholders, it is therefore necessary that all stakeholders believe in the benefits of the ISO 14001 standardization and promote it. With such a demand from stakeholders firms are more likely to transform certification into a potential competitive advantage. In conclusion, without the support of regulatory agencies, the dynamics of market or competitive forces alone may not be sufficient drivers to promote the diffusion of ISO 14001 and guaranty the convergence of voluntary environmental standards.

It seems that ISO 14001 are more likely to be adopted when government believe in the competitive advantage that their firms will gain out of ISO 14001 certification. Regulatory agencies by setting up a system that facilitates the adoption of ISO 14001, provide the ground for their firm to be ahead of competition in "lagger" countries. This is the case of some Asian and European countries where regulatory agencies compete for the adoption of a standard that might create barriers to trade for their industry.[44] This is consistent with the trading-up hypothesis developed by Vogel.[45] Such competitiveness rationale can promote a race to the top concerning voluntary environmental standard.

Apparently this incentive was not present in the US. U.S. firms seem quite hesitant to enter this race, as the EPA does not facilitate the development of the standard. Firms are therefore reluctant to adopt a standard, which does not provide much benefits on their national market. U.S. ISO 14001 certified companies are mostly multinational companies operating on European and Asian markets. There is still some skepticism in the U.S. with regards to self-regulation which might be seen as a legitimate instrument. As ISO 14001 is diffusing rapidly in other countries it is not clear how long U.S. regulatory agencies will be able to resist the trend.

[1] Welford, R., ed. 1996. Corporate Environmental Management, Systems and Strategies. London: Earthscan. P. 61

[2] Examples of Industry codes of practice are the US Chemical Management Association's Responsible Care program; the Global Environmental Management Initiative (GEMI), the Environmental Self Assessment Program, and many others. Great Britain is the first country which developed a national EMS' standard: British Standard 7750 in 1992.

[3] Struebing, L. (1996). '9000 standards.' *Quality Progress* 29(1): 23-28.

[4] In 1990, the British Standard Institute (BSI) started to consider the question of third party assessment of environmental performance. BSI had tackled the issue of quality management using a system approach producing the quality system standard BS 5750 (subsequently replaced by the ISO 9000 series of standards) and was of the opinion that environmental performance within organizations could be tackled using a similar approach, i.e. by the introduction of an environmental management system standard. The draft version of British Standard 7750 was published in March 1992. See Welford, R., ed. 1996. Corporate Environmental Management, Systems and Strategies. London: Earthscan.

[5] Europe's Eco-Management and Audit Scheme (EMAS) followed the development of BS 7750. EMAS was adopted by the European Union (EU) on June 29, 1993, and became effective April 10, 1995. The Commission originally intended to pursue mandatory participation but business lobbying successfully prevented this. Eden, Sally. 1996. *Environmental issues and business: implications of a changing agenda*. Chichester ; New York: John Wiley.

EMAS is a site-based registration system (i.e. the certification is granted for individual industrial sites) but considers off-site activities that may have a bearing upon environmental management at the registered site. EMAS is primarily aimed at the industrial sector.

[6] Von-Zharen, -. W.-M. 1996. ISO 14000 : understanding the environmental standards.: Government-Insts.

[7] Hall, R. M. J., and K. A. Tockman. 1995. International corporate environmental compliance and auditing programs. *Environmental Law Reporter* 25:10395-10407.

[8] The ISO originally focused on product technical standards. Then in 1979, the ISO decided to address quality management and assurance standards. As a result, ISO 9000 was published as a final standard in 1987. This system establishes standards for quality management in all areas of business and a process for registration or verification of compliance. ISO 9000 is voluntary, yet market forces have mandated ISO 9000 compliance as a virtual passport to international business. Up to the end of December 1997, at least 226,349 ISO 9000 certificates have been awarded in 129 countries worldwide.

[9] The International Organization for Standardization (ISO) was founded in 1946 to "promot[e] standardization and related activities in order to facilitate international exchange of goods and services." There are 111 member countries within the ISO and each country has 1 official representative. The United States' representative is the American National Standards Institute ANSI.

[10] Tibor, T. 1996. ISO 14000: a guide to the new environmental management standards: Irwin.

[11] The other sections were published in draft and are still being revised by TC 207.

[12] Reinhardt, F. L., and R. Vietor, H. K. 1996. *Business Management and the Natural Environment*. Cincinnati, Ohio: South-Western College Publishing.

[13] Wilson, R. C. 1998. What you don't know can definitely hurt you. *Pollution Engineering*, 30 (12):33-34.

[14] Mostek, M. 1998. Limited privilege and immunity for self-evaluative environmental audits. *Creighton Law Review*:545.

[15] Hart, S. L. 1997. Beyond greening: Strategies for a sustainable world. *Harvard Business Review* 75 (1):66-76.

[16] Hoffman, A. J. 1997. *From heresy to dogma : an institutional history of corporate environmentalism*. New Lexington Press ed. San Francisco, California: The New Lexington Press management. Esty, Daniel. C., and Michael. E. Porter. 1998. Industrial Ecology and Competitiveness. *Journal of Industrial Ecology* 2 (1):35-43.

[17] ISO 14001 is not linked to ISO 14020 to ISO 14025 which are the environmental labeling standards under discussion under the supervision of Technical Committee 207.

[18] ISO 14031 (*Guidelines on Environmental Performance Evaluation*) contains over 100 examples of measures and indicators, but it does not propose a core set of metrics for comparison and benchmarking of performance, nor does it establish performance levels.

[19] Delmas, M. 2001 "Stakeholders and Competitive Advantage: the Case of ISO 14001"*Production and Operations Management*. 10(3): 343-358

[20] 14 representatives of Member State Competent bodies or Ministries were interviewed. Competent Bodies in DK, FR, IR, LUX, NL, SW, the UK , Belgium, Spain. Ministries for the Environment in AU, FIN, GR, P were interviewed. Germany did not provide answers to these questions. The interviews were conducted during the time period 23/10/1997 to 5/11/1997.

140 registered EMAS sites in 12 Member States (11.6%) were interviewed by phone. Population data from EMAS Help Desk (31/12/97): 1211 EMAS sites in 12 Member States. GR, LUX and P had no registered sites. Population size in AU, DK, FR, FI, DE, NK, SE and UK meant EMAS sites were randomly selected for a minimum representative sample of 10%. The interview time period was 2/2/1998 to 23/2/1998.

The registered sites interviewed were distributed across three years: 9% for 1995, 44% for 1996, 47% for 1997.

[21] Council Regulation 1836/93, art. 1(1), 1993 O.J. (L 168) 1, 2.

[22] Directives and regulations are two methods of legislation in the European Union. Directives are most common in the Environmental area. By 1992, there were almost 200 environmental directives but only forty regulations. Once passed, a directive requires " harmonization" of the various Member States through national legislation passed in accordance with the directive. Various levels of harmonization are possible, sine Directives are binding, but only as to the result to be achieved. They leave to the national authorities the choice of form and methods.

[23] Ashford, N.A. 1994. An Innovation-Based Strategy for the Environment. *The Industrial Transformation Paradigm*:275-314.

[24] Gilbert, M. 1994. BS 7750 and the eco-management and audit regulation." *Eco-Management and Auditing* 1(2): 6-10.

[25] Question G.4.a: "What measures have been taken to inform companies of the requirements of EMAS?" Respondents 14 representatives of Member State Competent Bodies or Ministries.

[26] Question G.6.: " What financial budget (and over what time period) has been allocated to ifnorming companies and the public?". Respondents 14 representatives of Member State Competent Bodies or Ministries

[27] As published in the Official Journal OJ L104 22 April 1997.

[28] Question S.2a: "Is your site certified to ISO 14001?"

[29] Question S3: " Was the certification to ISO 14001 undertaken before, at the same time, or after EMAS validation?". Responses 26% before EMAS verification, 38% after EMAS verification and 36% at the same time as EMAS verification.

[30] S4:" Was the certification undertaken by the same organization that undertook your site's verification?" The 8% of sites which used different organizations for their site verification and their ISO 14001 certification were all of large sized enterprises.

[31] Question A.2.a " To date, approximately how many verifiers has your organization accredited?" Question A.2.b.: How many of these verifiers are organizations?". A.2.c. " How many of these accredited verifier organizations are also verifiers for ISO 14001?"

[32] Question S5ab:"Could you estimate how long achievement of EMAS took from the start of EMAS implementation to the verification of the site?"

[33] Question S.6.b "What element of EMAS took the most time to implement?"

[34] Question S.13a. " How many of your site's environmental statements have you distributed in total so far?"

[35] Question S.14a. "What in your opinion, are the 3 main audiences (or stakeholders) for your site's environmental statement?" Question s.14.b. " Which are the 3 main groups that have actually requested copies of your site's environmental statements?" The overwhelming majority (79%) of requests for environmental statements came from researchers and people in education/schools. Consultants (34%) are the second highest group requesting site environmental statements.

[36] Question s.15. " In your opinion, has the site's environmental statement been a useful communication tool with the site/company stakeholders that you have mentioned?"

[37] Question S.16a. " What are the 3 main benefits of EMAS implementation?"

[38] Bansal, P. 1999. Taking Stock of ISO 14001 certifications. Final Report. Washington D.C.: Environmental Protection Agency.

[39] The population of certified firms was so small (180) that it was almost impossible to compare it to a representative sample of non-certified companies since they were so numerous (billions of firms).

[40] Zuckerman, A. 1999. Using ISO 1400 as a trade barrier. *Iron Age New Steel* 15 (3):77.

[41] Delmas, M. 2000 "Barriers and Incentives to the Adoption of ISO 14001 in the United States." *Duke Environmental Law and Policy Forum*. Fall: 1-38.

[42] In December 1998, Western Europe accounts for 157,016 ISO 9000 certified facilities, 56% of the 279,583 worldwide certified facilities. The United States with 24,987 certified facilities account for 10% of the total.

[43] These countries include: Japan, China, South Korea, Taiwan, Hong Kong, Thailand, Malaysia, Singapore, Indonesia, Vietnam, and Sri Lanka . Among these countries, Singapore, Thailand, South Korea, Japan and China also offer technical or financial assistance to companies taking up ISO 14000. Some pro-active countries even had their pilot project put in place prior to the official publication of ISO 14001, to prepare their national certification bodies and industry for a quick implementation of the standard. OECD. 1998. What do Standards for Environmental Management Systems Offer? Background paper: Review of the Development of International Environmental Management Systems -ISO 14000 Standard Series-. Paris: Organisation for Economic Co-operation and Development.

[44] Esty, D. C., and D. Geradin (1998). 'Environmental Protection and International Competitiveness: A conceptual framework', *Journal of World Trade*, 32(3), pp. 5-46.

[45] Vogel, D. 1995. Trading up: consumer and environmental regulation in a global economy. Cambridge, Mass: Harvard University Press.