Trade impacts of administrative food import regulations: Evaluating the U.S. Bioterrorism Act

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Abstract

This paper deals with the effects of administrative, information-related import measures in the context of the Bioterrorism Act of the U.S. The results of a trade flow analysis for the years before and after the implementation of the Bioterrorism Act illustrate differences in the compliance costs between countries. This differentiation can be caused by learning costs that may differ among countries. The analysis highlights that perishable products and countries with small import quantities are mostly affected.

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1 Introduction

Regulatory requirements are abound in the international exchange of goods[2]. These regulations serve different purposes: they may ensure compatibility between complementary goods (e.g. computer and monitor), they may resolve imperfect information situations on markets (e.g. product safety standards to ensure a minimum quality when the product characteristics are not readily detectable for a consumer (milk pasteurization) or quality labeling in order distinguish product varieties), or, they may be used to regulate negative production or consumption externalities (e.g. environmental regulations). Numerous studies deal with the trade effect of specific details of these regulations and a literature overview can be found in WTO (2005).

Administrative import regulation is a subset in this regulatory framework that is concerned with the control and flow of imports and the alignment of the characteristics of those goods to national standards. Hence, ensuring compatibility in a broad sense (e.g. customs procedures, or goods classification) and elimination of information asymmetries are two of the main characteristics of administrative import regulation. Import regulation is furthermore characterized by the fact that it only applies to imports. This notion is relevant when trade and potential discriminatory effects against domestic products is analyzed.

The administrative burden related to import procedures and formalities can impose significant costs on the imported goods (2%-15% of the value of goods according to OECD 2002). Import protocols are dependent on product, country of origin, mode of transportation, and port of entry into a country, but may include the following measures: Data and documentation requirements, lack of transparency on requirements, lack of audit-based controls and risk-assessment techniques to justify certain barriers, high degree of unpredictability, lack of automatisation of procedures, or lack of co-operation between agencies (NATIONAL BOARD OF TRADE 2002).

There are two economic effects related to these import protocols. On the one hand, they increase the costs related to the international exchange of goods. In this sense, they can act as barriers to trade and

[1] Valuable comments of Bettina Rudloff are gratefully acknowledged. Section 2 is drawn from WIECK and RUDLOFF, "The Bioterrorism Act of the USA and International Food Trade: Evaluating WTO Conformity and Effects on Bilateral Imports", forthcoming in *Agrarwirtschaft* (German Agricultural Economics Journal).

[2] See for instance FAS (2001) where an overview on U.S. food and agricultural import regulation is provided.

decrease national and global welfare. On the other hand, they may facilitate the exchange of goods through standard-setting or the correction of market failure and hence have positive effects on welfare and import development.[3] The SPS Agreement foresees that regulatory measures shall be implemented in the least-trade distorting way (Article 5, SPS Agreement). Hence, if there is international consensus, ultimately formulated in guidelines by the relevant international standard setting bodies (e.g. Codex Alimentarius Commission) that the imposed regulatory requirement is necessary and that it is designed in the most efficient way, related implementation costs may be accounted under trade costs[4]. On the other side, if a regulation imposes requirements that are above international guidelines, generally accepted standards, or is without sound (scientific) justification, there is reason to believe that the standard is designed to act as a non-tariff barrier (NTB).

In the recent past, there is a trend towards the introduction of new additional administrative regulations in order to improve control and traceability of the product flow into and within countries. (e.g. U.S. Bioterrorism Act, EU New General Food Law of 2002[5]). This type of administrative regulation that improves the traceability of the products does not add any new measurable product quality attributes to the products, but increase the food safety of the product through the knowledge that potentially unsafe products can easily identified and removed from the food chain. The rationale for this form of government intervention is the aim to reduce risk reduction in the food chain. A systematic information exchange within and across the different stages of the food supply chain is needed in order to improve prevention of and response to food scares. Hence, we can classify it as regulations that are potentially welfare increasing since they correct information asymmetries and market failure (JOSLING ET AL. 2004 p. 14)[6].

This trend towards improved traceability in the food chain adds new measures to the classical elements (e.g. import licensing or certification, border inspections) used in import protocols. These new measures contain instruments such as the requirement of record keeping of source and recipients of products, registration of food facilities, or import notification. Depending on design and detail of these traceability regulations, they may be considered welfare increasing for the economy or act as a NTB that protect the domestic producers from competitive imports.

The aim of this paper is to provide a first evaluation of the trade impact related to the implementation of the food import related provisions of the "Bioterrorism Act" of 2003 of the United States. The next

[3] In this case, these import protocols are sometimes referred to as "measures" in order to underline the welfare enhancing effect. In this paper, we are following this convention, referring to barriers when we think that an administrative regulation has a welfare decreasing effect and using the term measure when the regulation is more focused on the correction of market failure and hence potentially welfare increasing.

[4] See ANDERSON and VAN WINCOOP (2004) for a detailed discussion.

[5] See EUROPEAN COMMISSION (2005).

section introduces relevant provisions of the U.S. Bioterrorism Act, analyzes the specific design of the enforcement measures, and evaluates implementation effects using bilateral import data for the years 2003-2005. The last section summarizes and concludes.

2 New administrative food import law: the U.S. Bioterrorism Act

As a response to September 11th, the U.S. implemented several security measures to ensure the safety of U.S. infrastructure and the food chain. Several new legislative acts shall help to reduce the vulnerability of the U.S. to terrorism. One of these measures is the *Public Health Security and Bioterrorism Preparedness and Response Act* of 2002 ("THE BIOTERRORISM ACT", BTA, CONGRESS OF THE U.S., 2002), entering into force December 12, 2003.

2.1 Import rules under the Bioterrorism Act

The objective of the Bioterrorism Act (BTA) is "to improve the ability of the United States to *prevent, prepare for,* and *respond* to bioterrorism and other public health emergencies" (Preamble of the BTA) by providing additional information and action tools to the administration.[7] The relevant rules for food products[8] cover the following four provisions:

1. *Administrative detention* of food is possible[9] when "credible evidence or information indicating that such article presents a threat of serious adverse health consequences or death to humans or animals" (Section 303) is given. Furthermore, authorities are allowed to debar persons or firms from imports into the U.S. when they repeatedly violate the import regulations set out in this act (Section 304).

2. *Registration of food facilities and determination of an agent is required* (Section 305): This provision requires domestic and foreign facilities that manufacture/process, pack, or hold food for human or animal consumption in the U.S. to register with the Food and Drug Administration (FDA). Domestic facilities must register whether or not their food enters interstate commerce foreign facilities

[6] In addition, THILMANY and BARRETT (1997) distinguish between welfare and demand effects resulting from *informative* and *uninformative* NTBs.

[7] The act in full can be found on the following web page: http://www.fda.gov/opacom/laws/. Additionally, the FDA maintains a separate web side with all relevant information on the BTA legislation and implementation (http://www.fda.gov/oc/bioterrorism/bioact.html).

[8] "Protecting Safety and Security of Food and Drug Supply" is Title III of the BTA. Another relevant title in the following analysis is Title II "Enhancing Controls on Dangerous Biological Agents and Toxins" aiming at the control of domestic laboratories using certain agents and toxins.

[9] The term *food* in this regulation generally refers to the definition as provided by Section 201(f) of the Federal Food, Drug, and Cosmetics Act. It includes all food and beverages for human and animal consumption including chewing gum and all items used for components of any such article.

must additionally designate a U.S. agent that can be any entity or individual person who lives or maintains a business place in the U.S. and is physically present in the U.S.[10]

3. *Establishment and maintenance of records is required* (Section 306). All domestic firms that manufacture, process, pack, distribute, receive, hold, or import food must establish and maintain a record keeping system. This measure applies to all foreign persons that transport food into the U.S. or place food directly in contact with its finished container.[11] Source and recipient of all food items must be recorded including address, type of food, brand, variety, type of packaging, and receive and delivery date. Records must be kept for six month to two years, depending on the nature of the food item, and must be accessible within 24 hours.

4. *Mandatory prior notice of food shipments* (Section 307) implies that all food items that are imported into the U.S. must be notified within a time frame, depending on the mode of transportation, of maximum five days and minimum 2-8 hours prior to arrival with information containing article specification, the manufacturer and shipper, the grower (if known within the specified time in which notice is required), the country of origin, the country from which the article is shipped, and the anticipated port of entry. An inadequate notice leads to import refusal or detention.[12]

Whether these rules are applicable to a specific product depends on the respective institutional competence (FDA or USDA) and only products under the responsibility of the FDA are affected by the new rules. Table 1 provides a summary of the most important import requirements that were in place prior to the BTA.[13] The previously enforced so-called "general import procedure" was easier especially in terms of the notification time frame for entry of food shipments, the registration of food facilities, and the record keeping obligations. According to this former system, the FDA received the information up to several days after arrival, implying that the food may have already been delivered to the ultimate consignee (FR 68, Vol. 197: 58976).

[10] All facilities regulated exclusively by the United States Departments of Agriculture (USDA) and private residences of individuals with food manufacturing or storage capacities, farms, restaurants, retail food establishments, non profit food establishments, and fishing vessels are excluded.

[11] Exclusions apply again to the group of facilities listed in the registration provision.

[12] Excluded from this requirement are items for personal use and gifts, products under USDA jurisdiction, and food that was made by an individual in the personal residence and enters the U.S. for non-business reasons.

[13] The basic reference for product and admissibility standards is the Food, Drug, and Cosmetic Act, but there exist numerous other laws that regulate the production and marketing of food products (e.g. Fair Packaging and Label Act). Further information can be found in FAS (2001).

Table 1 Changes in the import requirements for specific food categories due to the BTA

Product group	Basic legislation	Provisions in place prior to BTA supplementing the general import rules	Stronger provisions in BTA
Food categories not covered by the BTA (USDA authority)			
Meat, poultry and eggs	Federal Meat Inspection Act Poultry Products Inspection Act Egg Products Inspection Act	Equivalence of food safety system Inspection and approval of foreign facility Firm-related import permit Inspection at port-of-entry	not applicable
Food categories covered by the BTA (FDA authority)			
Low-acid canned products	FD&C Act Low-Acid Canned Food program	Registration of food facility Providing of processing information	()
Alcoholic beverages	FD&C Act Federal Alcohol Administration Act	Firm-related import permit	(+)
Fresh fruit and vegetable	FD&C Act	Inspection certificate Firm-related import permit	(+)
Dairy products	FD&C Act Federal Import Milk Act	Firm-related import permit Quota system	(+)
Seafood and live fish	FD&C Act Procedures for the Safe and Sanitary Processing and Importing of Fish and Fishery Products	HACCP system must be in place and verified by foreign government inspection authority or Equivalence or compliance agreement with the U.S.	(+)
Other food items (e.g. pasta)	FD&C Act	No specific requirements	(++)

Note: For alcoholic beverages, the Bureau of Alcoholic, Tobacco and Firearms is administering the Federal Alcohol Administration Act.

() indicates no or only minor changes due to the BTA provisions.

(+) indicates stronger provisions in the BTA in terms of prior notice, record keeping, and detention.

(++) indicates stronger provisions in the BTA with respect to all four provisions.

Source: Own compilation based on information from FDA, Animal and Plant Health Inspection Service (APHIS), Foreign Agricultural Service (FAS), Center for Food Safety and Applied Nutrition (CFSAN), Government Accountability Office (GAO).

However, some product categories faced more detailed import requirements already prior to the BTA enforcement and therefore the BTA does not lead to a stronger import protocol for these products. Depending on the category, these requirements consist of a registration of the food facility and specific product information that had to be filed with arrival at the port (low-acid canned products), obtaining of import permits prior to shipment (alcoholic beverages, fruit and vegetables, dairy products), or having a food safety control system (e.g. HACCP) in the production facility in place (seafood, live fish). The import permits were issued for the complete firm and kept valid for up to five years (e.g. fruits and vegetables). Therefore, for some products the provisions of the BTA do not alter very much

from already existing procedures (e.g. canned products), whereas for most other products (e.g. alcoholic beverages, fruit and vegetables, seafood, other food items) larger changes were initiated and relate to the above described information requirements and the timeliness of the import process.[14] The group of "other food items" faces the most drastic changes due to the BTA implementation as formerly no special requirements in addition to the general import procedures was in force. Depending on the ability of firms to adjust to these new components in the import protocols, this may lead to product and country specific trade impacts.

2.2 Evaluation of the specific design of the enforcement measures[15]

Non-discrimination and national treatment

Formally, the BTA provisions are applicable to all importers and thereby they are *non-discriminatory*. However, there may be some factual differences because of individual trade patterns: If some trade partners had certain bilateral arrangements facilitating trade prior to the adoption of the BTA, their situation became relatively worse compared to other countries. Similar findings might hold with respect to product categories affected differently (Table 1) and size of import quantities if we expect smaller lots to be affected relatively stronger. However, as these effects result from usual economic adjustments of trade patterns due to changed legislation, the provisions of the BTA as such cannot be interpreted as discriminatory.

National treatment is ensured since, in principal, the BTA provisions are applicable to both, domestic and foreign producers. Nevertheless, some provisions are either not relevant for domestic producers or their economic burden may be lower:

- The designation of a U.S. agent is not relevant for U.S. firms. Since there is already established a professional market offering the agent's services to foreign companies[16], this provision must be seen as problematic in the international framework as it certainly leads to a compliance cost difference between domestic and foreign producers. The specific burden for foreign companies is depending on the transactions costs and fees for finding and maintaining such representatives.
- Prior notice of imports is not relevant for domestic producers. Hence, they are not facing transportation delays as importers do. An evaluation of related costs identify significant additional burden for foreign companies (see Table 5).

[14] Note that the requirements related to obtain import permits or inspection certificates are still in place.

[15] Since the BTA was notified to the WTO under the SPS Agreement (see e.g. Notification on Prior Notice: G/SPS/N/USA/690), the evaluation follows the criteria laid out in the SPS Agreement.

[16] One example for such services is the company U.S. Food Agents, requiring around 600 $ for providing an agent for a facility per year. See http://www.usafoodagents.com/pricing.html#BPP, July 2005.

- Differences may also refer to the frequency of controls either at the border or critical points in the domestic supply chain. No cost assessments on different control types exist so far.

Equivalence

Equivalence grants flexibility in the implementation process, i.e. with respect to the choice of specific measures to achieve the protection level. The SPS Agreement explicitly encourages bilateral consultations on the acceptance of different implementation measures and refers to international guidelines for conformity assessment. In principal, this provision recognizes that regulatory flexibility allows countries to allocate resources efficiently rather than identical (JOSLING ET AL., 2004: 48). The burden of proof for demonstrating equivalence lies with the exporter. Trade can be hindered if the importer is not accepting the proof and additional import requirements or a trade ban are imposed. Equivalence agreements are potentially more beneficial for process than product standards since for product standards, compliance with existing standards can be checked directly by means of product characteristics. On the contrary, process standards are more difficult to verify at the border and need to be inspected through expensive on-spot controls in the exporting country itself (OECD, 1994). Equivalence agreements offer potential gains since they replace the proof of similarity which involves expensive on-spot measures for each standard. BTA provisions that define information and control aspects belong to this group of process standards. Here, equivalence agreements may facilitate trade. However, only very few equivalence agreements exist as administrative transaction costs for negotiating and accepting equivalent measures seem to be very high.[17]

Besides the comprehensive U.S. Veterinary Agreement with the EU, other equivalence acceptance only exists for certain meat and dairy products with selected partner countries (APHIS, 2004), or are addressed within free trade agreements (e.g. Chile).[18] The provisions of the BTA clearly overrule existing provisions within the bilateral agreements as far as FDA products are concerned.

Least-trade distortion

In this section, the implementation of the BTA measures regarding least-trade distortion will be evaluated.[19] Trade "distortion" will be assessed taking the trade impact as proxy. This is admissible

[17] The Veterinarian Agreement between the U.S. and the EU, signed in 1999, took six years of negotiations (JOSLING ET AL., 2004: 49).

[18] However, in free trade agreements, SPS measures are usually only covered in a very general manner via general cooperation obligations and the promise to implement WTO standards (see Chile-U.S. Free Trade Agreement, par. 6).

[19] Technical and economic feasibility of the measure is another (sub-) category related to a least-trade distorting implementation that has to be considered when evaluating any measure. However, in some WTO disputes, an import ban was the accepted answer to a sanitary or phytosanitary risk since all other measures of protection would be either too costly to implement or would not provide the same level of protection. As we are not comparing different alternatives for the U.S. to enforce their protection level, comparative conclusions on economic and technical feasibility cannot be drawn.

since we assume that a lower trade effect is associated with less trade distortion. Table 5 presents an overview of the cost and trade impact of the food related BTA provisions.

Table 2 Potential firm and trade impact of BTA provisions

Measure	Potential business impact	Potential trade impact	Cost of compliance estimates[1)]
Registration (US Agent)	(-) Increase of administrative burden (-) Maintenance of US Agents involves cost for firms	(-) FDA estimate: 16% of foreign firms will cease imports, especially firms with only few shipments	One time costs: $176 Agent fee: $1000
Record keeping	(0/-)Unclear. – Records might be covered by existing record keeping systems – If not: Increase of administrative burden	(+) Might increase quality assurance and logistics (+) Quick response in cases of emergencies might help to keep/restore consumer confidence	One time costs: $1517 Maintenance: $270
Prior notice	(0) Notice can be done mostly within normal import procedure (-) Importers working formerly under expedited arrival procedure have disadvantages (-) Problem of notification for firms without internet access/computer equipment	(-) Slow down of food entry into the U.S. due to prcessing or inspection problems (especially relevant for perishable products) (+) Inspections might be better targeted	One time costs: $3698 Costs per entry: $75
Detention	(-) Firms have to bear costs of detention: Cost of disposal or sale at reduced prices	(-) Increases uncertainty of trade	Costs per detention: $100-$90000 depending on product and procedures (handling, storage, appeal, re-labeling).

Note: (-)/(+)/(0) refers to a potentially negative/positive/unclear trade impact respectively.

1) Estimates result from the FDA "Analysis of Economic Impact" of the Proposed (Administrative Detention, Record keeping) and Interim Final Rule (Registration, Prior notice) published in FR 68, Vol. 90 and Vol. 197, respectively. Where a distinction in the FR was made, the assumed costs for foreign firms and sufficient English knowledge were chosen.

Source: Own compilation based on FDA.

There are two measures from which potential trade impact can be expected. The requirement to send a *prior notice* for all food shipments has different impact depending on the import procedure prior to the implementation of the BTA.[20] Furthermore, the prior notice can be only electronically submitted to the FDA, implying that firms without computer equipment and internet access either have to acquire this equipment or cease trade with the U.S. For some firms in developing countries this might be a difficult or impossible requirement, not only because of the occurring costs but also due to ineffective information technology.[21]

[20] In particular Mexico and Canada, countries with formerly expedited import procedures (see FR 68, Vol. 197: 59028) have disadvantages with the new system since planning of shipments and entry into the U.S. makes a longer time horizon necessary.

[21] Note that some of these administrative concerns were addressed by the FDA in the regulatory process. Upon suggestions of trading partners, the FDA streamlined their import information system and made prior notification within the usual import information processing system available (FDA, 2003).

A second potential and probably more significant trade impact results from the requirements that all foreign firms must designate a *U.S. agent* that represents their company in the U.S. and is 24 hours a day available 7 days per week. In theory, this agent might be a private individual since this person only serves as a communication link between the FDA and the foreign company and no legal liability is related to the function. In practice however, the requirement to be available 24 hours a day all year long is not easy to fulfil for private persons and most foreign firms are seeking some business partner, foreign chamber of commerce representative, or legal entity to execute that function. This results in costs that can differ considerably.[22] Given that the FDA estimated in its economic impact analysis of the proposed rules that up to 16% of the firms or an equivalent of up to 2% of all shipments might be affected by this regulation and cease trade with the U.S. (FR 68, Vol. 197: 58943) it is difficult to see that this requirement is addressed in the least-trade distorting way.[23] The FDA expected in particular that small firms with less than 10 yearly line entries into the U.S. will be affected by this provision.

The other two proposed measures, *administrative detention* and *record keeping*, should not impose too many new requirements on exporting firms, since record keeping of suppliers and recipients is well established in many countries.[24] Here again, countries with less developed food safety and traceability systems will have problems to comply. It is to assume that mainly developing countries will be affected by this provision.[25] The provision of *administrative detention* is probably the least trade distorting element of the BTA. In addition, a "Dear Colleague" Letter from May 27, 2004 further clarifies this rule and points out that they "do not [] foresee frequently using administrative detention under" this rule (FDA, 2004). A review of FDA detention statistics for the year 2005 reveals that no product detention related to Section 304 of the BTA has occurred.

2.3 Evidence from bilateral trade data

In this chapter we focus on the trade impact of the BTA provisions. As we have seen in the previous section, some of the provisions apply specifically to imports and involve compliance costs for the importing firms. Depending on the burden sharing of the costs, these are losses that either importers or exporters have to carry, thereby reducing their profits. If these compliance costs of foreign firms cannot be carried over to the market price of the importing country, these cost asymmetry between

[22] The company U.S. Food Agents requires e.g. around 600 $ p.a. whereas the German American Chamber of Commerce is providing this service for 140 Euro p.a. for member firms (see http://www.gaccny.com/index.php?id=71&L=1). See also KERR (2004).

[23] This is even more questionable given that an emergency contact for foreign firms is allowed to be located outside of the U.S.

[24] See also the traceability provisions in the EU (EUROPEAN COMMISSION, 2002).

[25] See OTSUKI ET AL. (2001) for an impact estimation and JAFFEE and HENSON (2004) for a discussion of standards on the competitive situation of developing countries.

domestic and foreign firms may lead to a substitution of imported with domestically produced goods (see ROBERTS ET AL., 1999, BALDWIN, 2001, BEGHIN and BUREAU, 2001, and BUZBY, 2003). These developments– if they take place – are assumed to be identified in the import pattern over time. Hence, we work under the hypothesis that potential trade effects of the BTA may be seen in reduced import volumes for food categories that are most affected by the compliance costs of the provisions.[26] This implies that we expect to see no changes in the trade pattern if the BTA provisions have only a minor or no trade impact. In this case, food imports after the implementation of the BTA will develop according to the trade pattern of the last decade, i.e. follow the positive trend that could be observed for a number of food categories (see Appendix).

Our approach follows an analysis provided by OECD (2003) where trade flow patterns were used to analyze if import quantities changed as a result of a policy reform. This approach implies that all deviations from past import patterns can be attributed to this policy change. This assumptions neglect other exogenous factors such as exchange rate movements, or changes in the macroeconomic or regulatory environment that may affect trade flows.[27] In addition, this method cannot distinguish among the individual impacts of single BTA provisions, but look at the regulatory impact as a whole. However, this approach provides a good starting point for a more thorough analysis of the trade impact and may hint on sectors that are of particular interest for such an analysis.

Given the findings of the analysis of the least-trade distorting effect of the BTA in the last section, our analysis of bilateral import data for the U.S. is driven by the following questions:

1. Does the import pattern change after the time of the implementation of the BTA?
2. What is the impact on small and large import volumes?
3. How are different types of importing countries affected?

We use bilateral import data for the U.S. as recorded in the World Trade Atlas which is based on the UN COMTRADE data base. The trade flow analysis is done for all relevant food categories (see Table 1). In the following analysis we compare the import pattern of the year 2003 ("before the BTA entered into force") with the year 2004 ("after the BTA entered into force").[28] We chose to only rely on a direct comparison of import developments of the two years adjacent to the BTA implementation, given that this comparative analysis of trade flow developments cannot account for any other exogenous

[26] Note that this hypothesis implicitly assumes that no positive demand effect is created through the BTA. NTB theory suggests that demand stimulation may occur when newly implemented standards achieve a higher safety level in the food chain and these new standards are comprehensible to consumers (THILMANY and BARRETT, 1997).

[27] These effects can be captured when estimating a gravity model or import demand system.

[28] Given that the BTA entered into force December, 8 of 2003, we have a small bias in the reference situation covering the trade volume of three weeks.

variables that may change (e.g. exchange rates, GDP) and impact on the trade pattern. Hence, a short-term comparison horizon is advisable. All calculations are done at HS4 level of the international commodity classification of the World Customs Organization, however for the ease of presentation, they are subsequently aggregated to HS2 level.

2.3.1 Import pattern before and after the implementation of the BTA

Table 3 presents an overview on the import pattern before and after the implementation of the BTA. In average, 4825 import lines[29] were recorded at the U.S. border during the reference period. After the implementation of the BTA, 15% of these import lines no longer show any trade with the U.S., 35% of the import lines show a decrease in the average trade volume, and 50% of the import lines recorded in the reference period show an increase in the trade volume after the implementation of the BTA.

Table 3 Import pattern before and after the BTA implementation (number of HS4 commodity lines)

	Prior to BTA	**After BTA (Import lines 2004)**							
Food category	**Import lines** (2003)	**stop**		**decrease**		decrease > 2 std.	**increase**		increase > 2 std.
	abs.	abs.	**%**	abs.	**%**	abs.	abs.	**%**	abs.
Fish, Seafood	531	75	14	195	37	15	261	49	73
Vegetables	441	88	20	153	35	21	199	45	52
Edible Fruits, Nuts	439	85	19	139	32	20	215	49	84
Spices, Coffee, Tea	431	81	19	152	35	13	198	46	61
Cereals	102	31	30	23	23	2	48	47	20
Milling, Malt, Starch	285	68	24	88	31	16	129	45	52
Misc Grain	251	49	20	80	32	10	122	49	49
Fats, Oils	311	52	17	106	34	13	153	49	66
Prepared Fish	123	14	11	38	31	2	71	58	20
Sugars	86	8	9	35	41	1	43	50	8
Cocoa	182	23	13	72	40	7	87	48	22
Baking Related	309	22	7	105	34	6	182	59	41
Preserved Food	542	61	11	210	39	14	271	50	68
Misc Food	350	38	11	122	35	10	190	54	50
Beverages	442	41	9	159	36	13	242	55	56
Sum	**4825**	**736**	**15**	**1677**	**35**	**163**	**2411**	**50**	**722**

Note: The analysis is done at HS4 classification. This table presents the aggregated results on HS2 level.

"Decrease (increase) > 2 std." represents the import lines where the decrease (increase) in the period after the implementation of the BTA where larger than the mean of the reference period minus (plus) two times the standard deviation of the respective import line in the reference period.

Source: Own calculations based on World Trade Atlas 2006.

The observation of the increase in trade volume for half of the import lines is in accordance with the observation that the *aggregate trade volume* of food imports increased also after the introduction of the BTA (see Appendix). This is an indication that not all importers were similarly affected by the

[29] Each import line represents the average imports at HS4 level of a country in the indicated time period. The terms "import line", "importer", and "importing country" are used interchangeable for these quantities.

BTA implementation. A further differentiation of the impacts will be provided in the following sections.

Out of the 35% import lines that show a decrease in trade volume, only 3% show a significant decrease, i.e. the volume reduction of the import line lays outside a confidence interval that was constructed around the mean of the import line in the reference period. If we add up the countries that stopped imports to the U.S. and those that showed a significant decrease, we may conclude that at least 18% of almost all U.S. food import *lines* of the year 2003 were negatively affected after the BTA implementation. Nevertheless, Table 3 shows that not all food categories are similarly affected. We observe a mostly negative impact for perishable products, spices, coffee, tea, and for various grain and processed grain products. On the other side, for most of the processed categories less impact can be found given that the number of countries that cease imports decrease considerably for those commodities.

In general, the findings are in line with the identified potential impacts of the FDA who estimated that around 16% of foreign firms will cease trade with the U.S. (see previous section). Similarly, the FDA expected a more severe effect for perishable products due to the time sensitivity of these products. An aspect that needs further consideration is the development of the trade pattern of the processed/value-added product groups such as sugars, preserved food, or miscellaneous foods. According to Table 1, these are the groups with the most significant changes in the import protocol, however, this is not reflected in the development of the import pattern.

2.3.2 Differences among small and large import volumes

Table 4 shows the development of the import pattern before and after the BTA implementation differentiated by small and large import volumes in the various HS categories. The volume differentiation of the import lines is done according to the total import volume in the year 2003. Subsequently, the lowest (“small”) and highest (“large”) quartile of the distribution is chosen for the analysis.

The comparison across all food categories shows a considerable impact difference for small and large import volumes: whereas only 1% of the large importers quit trade with the U.S., around 40% of the small importers ceased imports after the implementation of the BTA. For the group of importers that decrease imports since the implementation, we observe the opposite effect: only 20% of the small importers decrease the trade volume compared to 40% of the large importers. However the quartile with the small import lines contain a much higher number of cases where the trade reduction is considerably more pronounced (98 cases compared to only 1 for the large import volumes). The statistics on increase in trade volume after the adoption of the BTA follows again the trend observed already in the category of ceased imports: only 39% of the small import lines show an increase in imports compared to circa 60% of the import lines with the largest trade volumes. However, the

significance of the increase is much more pronounced for the small volumes. For the different HS categories the picture differs somewhat depending on the product, but the findings are in line with the developments observed in Table 3 where we concluded that perishable products and cereals based commodities seem to be more affected than processed food.

Table 4 Import pattern of small and large import volumes before and after the BTA implementation (number of HS4 commodity lines)

		Prior to BTA	After BTA (Import lines 2004)							
	Import volume	Import lines (2003)	stop		decrease		decrease > 2 std.	increase		increase > 2 std.
		abs.	abs.	%	abs.	%	abs.	abs.	%	abs.
Fish, Seafood	small	134	58	43	24	18	12	52	39	44
	large	134	1	1	68	51		65	49	1
Vegetables	small	112	65	58	15	13	7	31	28	25
	large	112	2	2	35	31		75	67	
Edible Fruits, Nuts	small	112	58	52	12	11	7	42	38	38
	large	112		0	39	35		73	65	4
Spices, Coffee, Tea	small	109	53	49	17	16	9	39	36	32
	large	109	1	1	45	41		63	58	
Cereals	small	27	14	52	2	7		11	41	9
	large	27	3	11	11	41	1	13	48	3
Milling, Malt, Starch	small	72	32	44	16	22	10	24	33	20
	large	72	3	4	32	44		37	51	5
Misc Grain	small	63	30	48	11	17	8	22	35	18
	large	63	2	3	20	32		41	65	7
Fats, Oils	small	79	26	33	15	19	4	38	48	33
	large	79	3	4	28	35		48	61	6
Prepared Fish	small	31	10	32	7	23	2	14	45	12
	large	31		0	10	32		21	68	
Sugars	small	22	8	36	5	23	1	9	41	5
	large	22		0	10	45		12	55	
Cocoa	small	45	16	36	15	33	6	14	31	11
	large	45		0	20	44		25	56	
Baking Related	small	78	18	23	20	26	6	40	51	25
	large	78		0	32	41		46	59	
Preserved Food	small	136	42	31	39	29	10	55	40	42
	large	136	1	1	55	40		80	59	3
Misc Food	small	88	30	34	17	19	3	41	47	34
	large	88		0	33	38		55	63	1
Beverages	small	112	32	29	32	29	13	48	43	35
	large	112		0	48	43		64	57	
Sum	**small**	**1220**	**492**	**40**	**247**	**20**	**98**	**480**	**39**	**383**
	large	**1220**	**16**	**1**	**486**	**40**	**1**	**718**	**59**	**30**

Note: The analysis is done at HS4 classification. This table presents the aggregated results on HS2 level.

"Decrease (increase) > 2 std." represents the import lines where the decrease (increase) in the period after the implementation of the BTA where larger than the mean of the reference period minus (plus) two times the standard deviation of the respective import line in the reference period.

Source: Own calculations based on World Trade Atlas 2006

2.3.3 Regional differentiation of the import pattern

Finally, we analyze the regional impact of the BTA implementation. We ordered the importing countries according to typical country classifications (NAFTA, CAFTA, LCD, etc.) and analyzed their import pattern (Table 5). Out of the 4825 import lines that were recorded in total for these country groups in the year 2003, 208 import lines came from NAFTA countries (i.e. Canada and Mexico). After the BTA implementation, we observe a stop of imports for 5% of the lines, a slight decrease for around 31% of the volumes, and an increase for the rest of the import lines.

Table 5 Regional differentiation of import pattern before and after the BTA implementation (number of HS4 commodity lines)

	Prior to BTA	**After BTA (Import lines 2004)**							
	Import lines (2003)	**stop**		**decrease**		decrease > 2 std.	**increase**		increase > 2 std.
	abs.	abs.	**%**	abs.	**%**	abs.	abs.	**%**	abs.
NAFTA	207	11	5	65	31	1	131	63	17
CAFTA	306	36	12	105	34	11	165	54	40
LDC	202	62	31	58	29	11	82	41	49
EU	1124	164	15	415	37	43	545	48	160
PacAsia	741	67	9	253	34	9	421	57	99
SAm	584	66	11	190	33	17	328	56	95
Africa	305	73	24	113	37	21	118	39	37

Note: The analysis is done at HS4 classification. This table presents the aggregated results on HS2 level.

The group of African countries does not include African LDCs.

"Decrease (increase) > 2 std." represents the import lines where the decrease (increase) in the period after the implementation of the BTA where larger than the mean of the reference period minus (plus) two times the standard deviation of the respective import line in the reference period.

Source: Own calculations based on World Trade Atlas 2006

If we compare this development with the one of the other country groups we can find a somewhat different picture. In particular for the LCD and African countries, a significant share of their trade seems to be affected by the BTA. However, as before, at the same time, we also can observe that some of their import quantities show slight to strong increases in the trade volume. The EU is the importer that shows by far the highest number of import lines into the U.S. before the implementation of the BTA. 15% of these imports are set out after the BTA implementation, and around 37% decrease with 10% (65) showing a significant reduction. On the other hand, 48% of the EU imports show light to strong increases.

Note again that the presented indicators disclose broad short-term changes in the import pattern after the BTA implementation that may result from the ongoing compliance process. Hence, the results should be cautiously interpreted and further statistical verification of these effects is desirable to obtain more robust results.

3 Conclusion

The analysis explored challenges in evaluating trade effects for the increasingly relevant NTB group of administrative, information-related import measures in the context of the Bioterrorism Act of the U.S. The exploratory analysis of the development of the import pattern of the U.S. before and after the implementation of the BTA shows that the BTA potentially did have an effect on the import pattern and trade of certain commodities (perishable products, grains) and countries (with small import volumes, LDC, Africa). The results illustrate differences in the compliance costs between countries. This differentiation can be caused by adjustment and learning costs that may differ among countries: Countries working prior to the legal amendment in a more open import environment characterized by expedited import procedures, free trade agreements, or equivalence agreements, face adjustments that may be relatively more difficult than for countries always used to strict rules. The same is true in relation to products for which stricter rules are in place under the BTA compared to other products. Additional analyses indicate the "fixed cost" character of administrative import rules as small import quantities are affected most. A special problem seems to appear for developing countries that are lacking technical or human resource capacities to comply with these new administrative rules. Developing countries often import only small lots which imply an over-proportional cost increase and they are often importers of those products for which major regulatory changes could be identified. However, the analyzed time span of imports under the new legislation is rather short. It is to assume that over times, firms are able to adapt to the new standards and reduce costs of compliance and that imports will move back towards old import levels.

4 References

APHIS (2004): Technical Trade Report – Special focus: SPS Issues and Free Trade Agreements, July 2004.

ANDERSON, J.E., WINCOOP, E.VAN (2004). Trade Costs, In: Journal of Economic Literature XLII: 691 – 751.

BALDWIN, R.E. (2001): Regulatory Protectionism, Developing Nations and a Two-Tier World Trade System. In: Maskus, K. et al. (Eds.): Quantifying the Impact of Technical Barriers to Trade. Can it be Done?. The University of Michigan Press, Ann Arbor: 59-93.

BEGHIN, J.C., BUREAU, J.-C. (2001). Quantitative Policy Analysis of Sanitary, Phytosanitary and Technical Barriers to Trade, In: Économie Internationale 87: 107 -130.

BUZBY, J.C. (2003)(ed): International Trade and Food Safety, Economic Theory and Case Studies. Agricultural Economic Report Number 828, USDA-ERS.

CONGRESS OF THE U.S. (2002): Public Health Security and Bioterrorism Preparedness and Response Act of 2002. Public Law 107-108. Public and Private Law, 107th Congress, United States.

EUROPEAN COMMISSION (2002): Regulation (EC) No 178/2002 of the European Parliament and of the Council of 28 January 2002 laying down the general principles and requirements of food law, establishing the European Food Safety Authority and laying down procedures in matters of food safety. Official Journal of the European Communities L 31/1, Art. 18.

EUROPEAN COMMISSION (2005): Guidance Document. Key Questions related to Import Requirements and the new Rules on Food Hygiene and Official Food Controls. DG Health&Consumer Protection. European Commission. Brussels.

FAS (2001): Food and Agricultural Import Regulations and Standards Report. Foreign Agricultural Service.

FDA (2003): FDA and Bureau of Customs and Border Protection Announce Steps to Streamline Collection of Information on Food Imports. FDA News, May 27, 2003.

FDA (2004): "Dear Colleague" Letter on Administrative Detention Final Rule. Center for Food Safety and Applied Nutrition. FDA.GEORGE, R.M.J (2003): Implementation Issues in SPS- A Developing Country Perspective for Development Agenda on the Meandering Pathways from Doha to Cancun. Research and Information System for the Non-Aligned and Other Developing Countries, Working Paper 58/2003.

JAFFEE, S., HENSON, S. (2004). Standards and Agro-Food Exports from Developing Countries: Rebalancing the Debate. World Bank Policy Research Paper 3348. Washington D.C.

JOSLING, T., ROBERTS, D., ORDEN, D. (2004): Food Regulation and Trade, Toward a Safe and open Global System. Institute for International Economics, Washington D.C.

KERR, W.A. (2004): Homeland Security and the Rules of International Trade. In: Journal of International Law and Trade Policy 5: 1 – 10.

NATIONAL BOARD OF TRADE (2002): Trade Facilitation – Impact and Potential Gains.

OECD (1994): Trade and Environment. Process and Production Methods.

OECD (2002): Business benefits of trade facilitation. Working party of the trade committee, TD/TC/WP(2001)21/FINAL.

OECD (2003): The impact of Regulations on Agro-food Trade: The Technical Barriers to Trade (TBT) and Sanitary and Phytosanitary (SPS) Agreements.

OTSUKI, T., WILSON, J.S., SEWADEH, M. (2001): Saving two in a billion: Quantifying the Trade Effect of European Food Safety Standards on African Exports. In: Food Policy 26: 495-514.

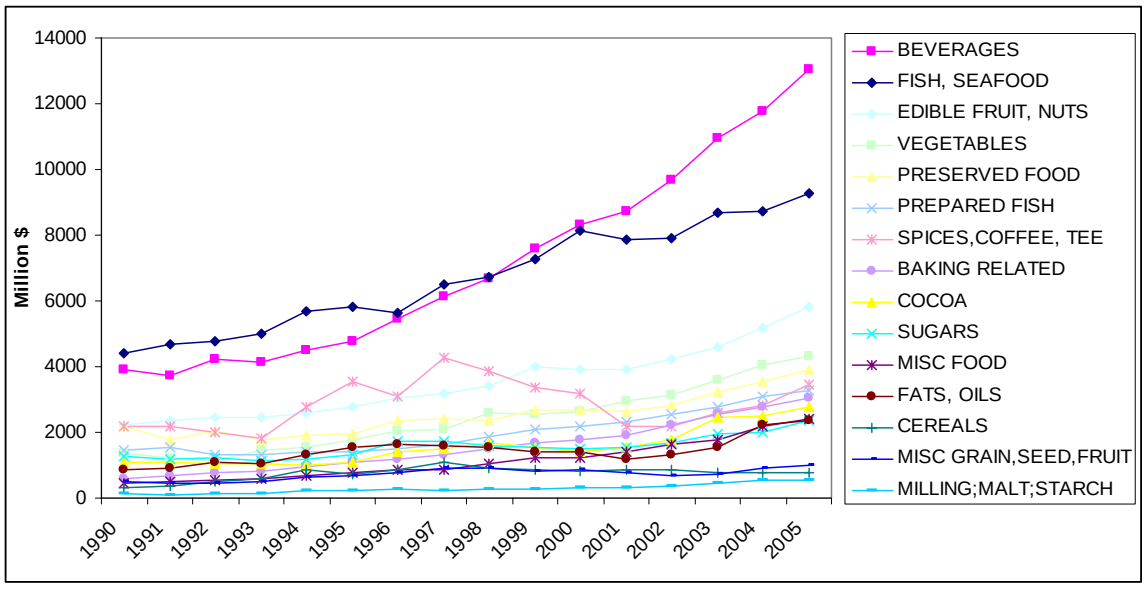
ROBERTS, D., JOSLING, T.E., ORDEN, D. (1999). A Framework for Analyzing Technical Barriers in Agricultural Markets. Technical Bulletin No. 1876, USDA-ERS.

THILMANY, D.D., BARRETT, C.B. (1997): Regulatory Barriers in an Integrating World Food Market, In: Review of Agricultural Economics 19: 91-107.

WTO (2005). The Economics of Standards and Trade. Thematic Issues. World Trade Report 2005, WTO: Geneva.

5 Appendix

Figure 1 Development of aggregated U.S. import volumes (HS2 classification)



Source: World Trade Atlas 2006