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US phytosanitary restrictions: the forgotten non-tariff barrier

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Abstract

Purpose – This paper aims to provide new evidence that the US phytosanitary regime is associated with a restrictive market access environment for fruit and vegetable products. One chief reason seems to be that the US regime uses a positive list approach, under which only authorized countries can export.

Design/methodology/approach – The methodology of the paper is primarily qualitative. This paper reviews the US sanitary and phytosanitary measures (SPS) system and its scope for use to protect markets, in addition to protecting life and health. The approach is institutional and political economic.

Findings – For most products, only a portion of global production is authorized for export to the USA. Even among authorized countries, only a small proportion is actually exported. As a result, the number of countries exporting fresh fruit and vegetables to the USA is far lower than those exporting to countries like the EU and Canada, but it is on a par with markets known to be restrictive in this area, such as Australia and Japan. Using a data set of fruit and vegetable market access and political contributions, this paper also provides evidence showing that domestic political economy considerations may influence the decision to grant market access to foreign producers.

Originality/value – The US SPS system has not previously been analyzed in this way, and the distinction between negative and positive list approaches is highlighted in terms of its implications for third-party exporters. Similarly, the analysis of political contributions is novel and suggestive of an important dynamic at work in the determination of the US policy.

Keywords International trade, Trade policy, Political economy of trade policy, Standards, SPS, and TBT

Paper type Research paper

1. Introduction

Sanitary and phytosanitary measures (SPS) present significant obstacles to agricultural exporters, particularly to small producers in developing countries. Although standards in importing markets like the European Union and the USA can act as catalysts for production and supply chain upgrading in poorer countries (Maertens and Swinnen, 2009), the adaptation costs involved, including notably large fixed costs, can be substantial and may exceed the capacity of some producers (Henson and Jaffee, 2004).

JEL classification – F13, F15, O24

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Producers are increasingly facing the challenges posed by standards in importing markets, particularly SPS measures. Market access issues posed by standards are clearly acknowledged in the World Trade Organization (WTO) framework, in particular the SPS Agreement and the Agreement on Technical Barriers to Trade, but negotiations on agricultural market access keep focusing on tariffs and more traditional non-tariff barriers such as subsidies. Not unlike policy, analysis is also lagging behind the market realities: data constraints have made it difficult for researchers to shed more than partial light on the mechanisms at work in the SPS area, and the effects they have on developing country exporters. SPS measures are complex, often product-firm- and process-specific and non-transparent. They remain difficult to grasp for non-specialists, including trade policymakers and analysts.

Unlike traditional instruments of trade policy, SPS measures are not usually designed to restrict trade. Rather, they aim to meet legitimate health and plant protection objectives, which complicate the task of disentangling acceptable regulatory stances from possibly protectionist ones. To date, the main concern in this regard has been on human health impacts (Otsuki *et al.*, 2001), probably because they resonate more in public policy debates than does the protection of plants from pests and pathogens[1]. Plant pest outbreaks have a direct impact on the environment and on producers' income, who, in developed economies, only represent up to 1 or 2 per cent of the population. Food safety outbreaks are direct threats to consumers' well-being and even sometimes to their lives, but pest outbreaks have a much more indirect effect. Yet, each objective – the protection of health and of plants – requires a different set of measures, and both potentially have trade impacts. For instance, a survey of Guatemalan exporters[2] of non-traditional agricultural exports[3] showed that they were much more afraid of pest outbreaks resulting in import bans in the USA than of import refusals from the Food and Drug Administration (FDA) based on food safety parameters. This is the focus of this paper: SPS measures designed to preserve plant health by preventing the spread of pests – so-called phytosanitary measures – and more specifically the mechanisms that can give rise to market access restrictions in the USA.

A further issue is that, unlike traditional trade measures like tariffs, SPS measures are implemented very differently, and in *ad hoc* ways, across destination markets, even in cases where regulatory objectives might actually be quite close. Exporters with limited supply capacity and ability to explore different markets have to make choices about which market they should target. Differences across markets regarding conditions of access are relatively difficult to assess, resulting in uncertainty for prospective entrants. Reliance on a small number of geographical destinations also places producers at a particular risk of adverse demand shocks. It is to be expected that differences in enforcement, and beyond that differences in enforcement capacity, translate also into differences in market assess costs, some of which are fixed sunk costs. This is the beach head effect posited by Baldwin (1988). Recent attempts in the empirical literature to draw measurable comparisons across markets confirm this suspicion (Kee *et al.*, 2009).

In this paper, we focus on the US system of phytosanitary measures, the compliance which determines the right to export to the USA from a given geographical origin. This system is complex, and this can have profound implications for developing country exporters, as the outcome is often that market access is precluded altogether. For many exporters, these phytosanitary requirements are a prohibitive non-tariff barrier. Most relevant is the "positive list" approach used by the USA, in which only those countries

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that have been specifically approved by the US authorities are able to export fresh fruits and vegetables (FF&V) to the USA. This system is potentially highly restrictive, as it prohibits entry for any product that has not been pre-approved, and requires producers to navigate a costly and complex web of regulations and standards before accessing the market. There is also ample scope for domestic producer lobbies to be involved in the regulatory approval process and potentially "game the system" to the detriment of developing country exporters. As a result of these characteristics, we find that market access in the USA is considerably more restricted than that in markets like the EU or Canada: the number of countries authorized to export FF&V to the USA is usually a small fraction of the world's total producers or exporters.

Numerous case studies have already provided persuasive anecdotal evidence of the restrictive nature of the USA FF&V import regime for certain products. Two long-running disputed cases about access to the US market have been extensively discussed in the literature: Mexican Hass avocadoes (Roberts and Orden, 1997; Lamb, 2006; Romano, 1998; Orden *et al.*, 2001; Carman *et al.*, 2006; Peterson and Orden, 2008a; Peterson and Orden, 2008b) and Argentinian citrus fruits (McLean, 2004; Stewart and Schenewerk, 2004; Cororaton *et al.*, 2011; Thornsbury and Romano, 2007). The well-documented analysis provided by this body of studies suggests that there has been a capture of the regulatory process by special interest groups. One effective strategy used by US producers' associations highlighted in these case studies is the systematic questioning of the reliability of USDA's scientific conclusions. Doing so successfully raised entry costs of rival potential exporters (a predatory tactic first theorized by Salop and Scheffman, 1983) and delayed the process of market access in some instances by several years.

Recent empirical work has sought to assess the impact of US SPS measures. Karov *et al.* (2009) construct a database of US SPS measures affecting FF&V imports, but find mixed results for the impacts of treatments and the granting of new market access on trade flows. Jouanjean *et al.* (2012), by contrast, consistently find that import refusals on sanitary grounds are a significant determinant of export flows, and that they have significant spillover effects beyond the individual shipments in question. Together, these studies highlight the fact that many developing countries have difficulty complying with US SPS measures, and thus have difficulty exporting FF&V consistently to the USA.

In this paper, we argue that, in practice, if not *de jure*, US phytosanitary measures amount to a prohibitive non-tariff barrier for many developing countries, in the sense that they are not authorized to export certain products at all to the USA. However, the regulatory regime lying behind these measures is poorly understood and information about it is very diffuse. We present a summarized picture of the US regime in Section 2. In Section 3, we attempt to solve part of the information gap by building a data set of US FF&V market access for the period of 1994-2011. We use the data set to show that the USA tends to import from a narrower range of countries than would be expected based on experience in other major markets. In Section 4, we turn from the impacts of the US phytosanitary regime to one of its possible determinants: domestic political economy. There is suggestive evidence that the US authorities authorize fewer countries to export in organized sectors (those that make political contributions, or where production is heavily concentrated) than in unorganized ones. Section 5 concludes.

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2. The US market access regime for fresh fruits and vegetables: an overview

Border measures like tariffs are only part of the regulatory thicket that potential exporters of FF&V need to negotiate their way through to access a foreign market. The USA is no exception to that rule. However, its system stands out as potentially particularly restrictive compared with that of other countries because of three factors:

(1) its complexity, which leaves considerable room for the operation of political economy forces;

(2) the fact that it uses a positive list approach, i.e. countries must be authorized by the USA before their firms can start exporting to that market; and

(3) the relative lack of genuine additional market access accorded by reforms following the WTO SPS Agreement.

This section examines the US system from a market access point of view as a way of setting the scene for the empirical analysis in the remainder of the paper[4].

Although the focus of this paper is on market access, it is important to remember that the US phytosanitary system was designed with legitimate plant protection objectives in mind. The public policy of plant protection is somewhat different from the more well-known area of food safety standards. It has a strong public good aspect, as a failure to implement proper protection can lead to the spread of pests throughout the national area. The key factor is risk management. Risk varies widely across exporting countries because of climactic and environmental conditions, which means that some specificity in approach is required. The level of domestic production in the USA is also relevant because it determines the extent of a potential quarantine pest to cause damage to US crops. To be clear, the purpose of this paper is not to suggest that the US plant protection regime should be "rolled back" on market access grounds, but simply to highlight some of the trade-related costs that come with the regime in its current form – and to show that alternatives, such as a negative list approach, may achieve a similar level of protection without the same level of restrictiveness in market access.

2.1 The general regime

Within the US Department of Agriculture (USDA), the Animal and Plant Health Inspection Service (APHIS) and its Plant Protection and Quarantine (PPQ) program is in charge of protecting US agriculture and plants against the entry of foreign pests and diseases. As such, APHIS administers and regulates – including prohibiting – market access for FF&V imports. APHIS has the responsibility to prohibit entry into the USA of food and agricultural products that contain pests or diseases that may affect domestic animals and plants.

The USA uses a "positive list" approach to the regulation of FF&V imports: all products from all countries are prohibited entry into the USA unless explicitly allowed by a regulation. By contrast the European Union uses a "negative list" approach: the EU forbids imports of selected products from specific countries based on identified phytosanitary issues (European Commission, 2006). For some other countries, the EU requires phytosanitary certificates issued by a National Plant Pest Organization (NPPO) declaring the imported product to be free of quarantine pests. The EU protection system relies mostly on plant health checks that are a complete examination or an examination of samples before entry into the EU. Less stringent checks are implemented when

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guarantees are provided. The main difference is therefore that imports of FF&V in the EU do not need to go through a pre-approval process, as they must in the USA. As a result of this important difference in approach, there is clear potential for the US regime to be more restrictive in practice – a possibility that we explore in Section 3.

A first reform to improve the system took place in 1992 (Federal Register, 2006), when new rules came into force mandating the recording of every new eligible FF&V production directly in the regulation. The underlying rationale was to improve transparency such that the regulation prohibited any importation into the USA unless entry eligibility was explicitly mentioned in it. However, it rapidly appeared that this new approach did not work out well with the rising number of requests for FF&V market access to the USA. Over time, the regulation became increasingly complex and marred by many redundancies. Also, rulemaking was revealed to be particularly burdensome, and the whole process could take 18 months to three years on average (Federal Register, 2007). Some export requests took considerably longer than the average. For example, a Chinese request to export fragrant pears to the USA took 12 years. According to Karp (2006), Chinese officials issued a first request in 1993 and the USDA only granted approval in December 2005 after repeated visits by the Department of Agriculture scientists and revisions of mandated measures. In general, various exporters have highlighted the particularly long process behind obtaining market access to the USA. Even the EU has signaled to the WTO SPS Committee that it has experienced very lengthy decision-making procedures when trying to export some plant products to the USA (WTO Committee on Sanitary and Phytosanitary Measures, 2011).

A second reform, known as "Q56", was adopted in 2007[5]. Its objective was to avoid the burdensome rulemaking procedure and replace it with a notice-based approach for those products for which relatively straightforward and established phytosanitary measures are sufficient for entry into the USA[6]. New market access using notices have been rapidly granted under the AGOA initiative to African countries in 2008 for the following products: baby corn and baby carrots from Kenya; asparagus from Senegal; and eggplant, okra and pepper from Ghana. Since then, other countries such as Mexico, Chile, Panama, Malaysia, and Vietnam have secured new market access following this new process. However, very few new accesses have been granted since 2012 (Table I).

2.2 Negotiating market access

The US decision to accept imports of a new product from a specific country relies on a risk-based approach. A request of eligibility for entry of a new FF&V must first be submitted to APHIS by the exporting country's NPPO. Then, as is required by the WTO SPS Agreement and to base the final decision on a scientific justification, APHIS PPQ conducts a Pest Risk Analysis (PRA), which can take two or three years on average (Miller, 2006). An "appropriate level of protection" is defined according to this PRA. The objective of the procedure is to identify if any mitigation measures are necessary, applicable and efficient enough to minimize the risk of entry of any quarantine pests into the USA.

Many factors contribute to the burdensome nature of the eligibility determination process. According to Miller (2006), countries do not always provide complete lists of pests, as required by the early stages of the process. As a result, APHIS agents must undertake their own research, which is one cause of delay[7], and sometimes of disagreements with the applicant country.

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Table I.
New market access according to the new notice-based approach

Year	Country	Product	Notice of decision to issue permits	
2007	Ghana	Eggplant	72 FR 59239–Notice of Decision to issue permits for the importation of eggplant and okra from Ghana	Federal Register. Notices. Notice. Friday, October 19, 2007
		Okra	72 FR 59239 – Notice of Decision to issue permits for the importation of eggplant and okra from Ghana	
	Kenya	Baby Corn	72 FR 59239 – Notice of Decision to issue permits for the importation of husked, silk-free baby corn from Kenya	
		Baby Carrots	72 FR 59240 – Notice of decision to issue permits for the importation of peeled baby carrots from Kenya	
	South Africa	Blackcurrants	72 FR 59241 – Notice of decision to issue permits for the importation of ribes species fruits from South Africa	
2008	Panama	Rocket	73 FR 839 – Notice of decision to issue permits for the importation of arugula leaves with stems from Panama	Federal Register. Notices. Notice. Friday, January 4, 2008
	Australia	Cherries	73 FR 5495 – Notice of decision to issue permits for the importation of sweet cherries from Australia	Federal Register. Notices. Notice. Wednesday, January 30, 2008
	South Korea	Dropwoth leaves	73 FR 14956 – Notice of decision to issue permits for the importation of dropwort leaves with stems from South Korea	Federal Register. Notices. Notice. Thursday, March 20, 2008
	Vietnam	Pitaya	73 FR 44216 – Notice of decision to issue permits for the importation of dragon fruit from Vietnam	Federal Register. Notices. Notice. Wednesday, July 30, 2008
	Mexico	Guavas	73 FR 60673 – Notice of decision to issue permits for the importation of guavas from Mexico	Federal Register. Notices. Notice. Tuesday, October 14, 2008
	Senegal	Asparagus	73 FR 77594 – Notice of decision to issue permits for the importation of fresh white asparagus from Senegal	Federal Register. Notices. Notice. Friday, December 19, 2008
2010	Chile	Pomegranate	75 FR 26707 – Notice of decision to issue permits for the importation of fresh pomegranates and baby kiwi from Chile	Federal Register. Notices. Notice. Wednesday, May 12, 2010
		Baby Kiwi	75 FR 26707 – Notice of decision to issue permits for the importation of fresh pomegranates and baby kiwi from Chile	
	Israel	squash flower	75 FR 29309 – Notice of decision to issue permits for the importation of fresh male summer squash flowers from Israel	Federal Register. Notices. Notice. Tuesday, May 25, 2010
	Panama	Coriander	75 FR 34687 – Notice of decision to issue permits for the importation of fresh false coriander from Panama	Federal Register. Notices. Notice. Friday, June 18, 2010
	Pakistan	Mango	75 FR 52712 – Notice of decision to issue permits for the importation of fresh mango fruit from Pakistan	Federal Register. Notices. Notice. Friday, August 27, 2010
	Mexico	Sweet lime	75 FR 56981 – Notice of decision to issue permits for the importation of sweet limes from Mexico	Federal Register. Notices. Notice. Friday, September 17, 2010
	UK	Wall rocket leaves	75 FR 71415 – Notice of decision to issue permits for the importation of wall rocket leaves from the UK	Federal Register. Notices. Notice. Tuesday, November 23, 2010
2011	Jordan	Strawberries	76 FR 8997 – Notice of decision to issue permits for the importation of fresh strawberries from Jordan	Federal Register. Notices. Notice. Wednesday, February 16, 2011
	Chile	Fig	76 FR 18511 – Notice of decision to issue permits for the importation of fresh figs from Chile	Federal Register. Notices. Notice. Monday, April 4, 2011
	Malaysia	Rambutan	76 FR 21854 – Notice of decision to authorize the importation of fresh rambutan fruit from Malaysia and Vietnam	Federal Register. Notices. Notice. Tuesday, April 19, 2011
	Vietnam	Rambutan	76 FR 21854 – Notice of decision to authorize the importation of fresh rambutan fruit from Malaysia and Vietnam	
2012	Colombia	Arugula	77 FR 29588 – Notice of decision to issue permits for the importation of fresh celery, arugula, and spinach from Colombia	Federal Register. Notices. Notice. Friday, May 18, 2012
		Celery	77 FR 29588 – Notice of decision to issue permits for the importation of fresh celery, arugula, and spinach from Colombia	Federal Register. Notices. Notice. Friday, May 18, 2012
		Spinach	77 FR 29588 – Notice of decision to issue permits for the importation of fresh celery, arugula, and spinach from Colombia	Federal Register. Notices. Notice. Friday, May 18, 2012
2013	Egypt	Strawberry	78 FR 13304 – Notice of decision to issue permits for the importation of strawberry fruit from Egypt	Federal Register. Notices. Notice. Wednesday, February 27, 2013

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If any pest meets the criteria determining it as a "quarantine pest" within the meaning of the relevant US regulations, APHIS PPQ follows up with a Pest Risk Management (PRM) analysis. The objective of the PRM is to define if any mitigation measures exist and their level of efficiency and feasibility, as well as any impact if the pest were to be accidentally introduced into the USA. Under this approach, the APHIS PPQ proposes a mitigation plan to the applicant country. However, if there is no satisfactory solution and/or guarantees that the country will properly follow the mitigation plan, access to the US market is denied.

Following the WTO SPS Agreement, APHIS should determine the measure providing the necessary protection with the minimum negative impact on trade. Mitigation measures proposed by APHIS can, in some cases, be complex and burdensome. The most common measure is the requirement of specific treatments. Those treatments have to be applied before the product is exported, or sometimes at the port of entry if the necessary facilities exist. Another method is a recourse to the "systems approach" that we discuss in the next section. At the end of the PRA process, if an efficient mitigation procedure has been identified or if the PRA shows that no mitigation measures are necessary, APHIS initiates the rulemaking process for registration of the proposed FF&V in the regulation.

To conduct a PRA is costly and requires high-level expertise and resources, and some developing country officials have highlighted the difficulty of effectively and efficiently implementing a PRA[8].

The reliability and accuracy of a PRA and mitigation measures is potentially open to contestation by domestic interests: Cororaton *et al.* (2011) mention that discussions between the USA and Argentina for citrus focused on these two concerns. Thornsbury *et al.* (2007) furthermore state that a scientific debate is likely to be more contentious and sustained in cases where the political stakes are greater.

The main conclusion from this overview is that despite two reforms, the US regime remains based on a positive list approach which, in practice, is restrictive in view of the time-consuming and potentially costly nature of the admission process for prospective exporters. We complete this review in the following section with a discussion of two measures to facilitate market access: the systems approach and cooperation agreements.

2.3 The systems approach

The systems approach, which is intended to facilitate market access, particularly following passage of the SPS Agreement, offers an alternative to traditional risk mitigation measures. By combining various risk management measures, the systems approach can enable market access when traditional single treatments would not provide the required level of protection from quarantine pests. The term was first used to describe the approach used to reduce pest risks associated with the importation of avocados from Mexico but the practice in the USA goes back to the 1960s, first applied in 1967, to allow access to Unshu oranges from Japan and Korea (National Plant Board, 2002).

According to the Food and Agriculture Organisation (FAO)'s (2002) International Standard for Phytosanitory Measures, a systems approach is "the integration of different pest risk management measures, at least two of which act independently, and which cumulatively achieve the appropriate level of phytosanitary protection". In addition to the traditional post-harvest measures, processes incorporated into the

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systems approach include insect trapping and control, growing and packing requirements and geographical limitations. The concept behind the systems approach is that several methods while individually not mitigating the risk of introduction of a pest to a sufficiently low level of probability[9] will do so additively. A systems approach can also be used to achieve maximum levels of risk reduction (i.e. a second best to an ideal of 100 per cent elimination that is not achievable by known or acceptable means save for outright prohibition) for phytosanitory risks that are judged particularly serious, such as certain plant pathogens (National Plant Board, 2002).

An example of a systems approach is the one applied to Mexico's avocados (CFR 319.56-30): they must meet a nine-requirement list that includes trapping; orchard certification; limited production area (Michoacan); trace-back labeling; pre-harvest orchard surveys for all pests; orchard sanitation; post-harvest safeguards; fruit cutting and inspection at the packinghouse; port-of-arrival inspection and preclearance activities[10]. The basic motivation behind the implementation of the systems approach is to combine mitigation measures and risk-based controls.

According to Stewart and Schenewerk (2004), the use of the systems approach is not popular with the US domestic industry, which disputes its scientific relevance and capacity to protect against foreign pest invasion. They further contend that APHIS's use of a systems approach does not allow an opportunity for domestic producers to participate in the evaluation of the planned measures (including whether they are scientifically based), and that there is no system of compensation to domestic producers in case of faulty risk assessment.

2.4 Cooperation agreements and the commodity pre-clearance program

Preclearance consists of ensuring that exports meet the criteria for admission to the US market before shipment. Therefore, screening and treatment of FF&V exports are performed by APHIS agents in the exporting country. Like the systems approach, preclearance of commodities in the country of origin has been in use, albeit on a limited basis, for some time. Preclearance is both seen as a means to mitigate pest risks in countries that lack the technical capacity to have eradication programs (National Plant Board, 2002) and to speed up the export process, as problems can be tackled at the source.

Before any preclearance program can be implemented, APHIS and the exporter (the foreign government or producer) must agree to a "Cooperative Service Agreement", renewed every year, establishing the terms and conditions that must be met prior to the implementation of a commodity pre-clearance program. The preclearance program operates on the basis of full recovery of APHIS's costs. The country of origin or the private export group is required to provide funds in advance (annually) under a trust fund agreement (USDA, 2002).

Like the systems approach, preclearance programs are presented as a facilitating measure, and indeed they can be voluntary. For instance, Jamaica initiated a preclearance program in 1984. From 1984-1995, the program was co-sponsored by the Ministry of Agriculture and Fisheries in conjunction with the US Agency for International Development (USAID). Then, the Jamaica Exporters' Association took over for the period 1995-2001, and since April 2001, the Ministry has independently funded the program. In 2011, Jamaica had a list of 52 horticultural commodities with a preclearance program. In 2004, APHIS had voluntary preclearance programs in place in

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16 countries[11]. However, preclearance programs and consequently trust fund agreements are also mandated for certain exports.

Implementing a preclearance program is a complex procedure, which is closely monitored by APHIS from the official exporting country proposal stage onward (USDA, 2002). Preclearance notably includes the construction of a dedicated treatment facility that must operate according to APHIS specifications, and requirements regarding the location and accessibility of the facility. However, the mere existence of costs is not sufficient to conclude that this approach contravenes the WTO SPS Agreement, according to which such measures should be the least trade-restrictive measure assuring the required level of plant safety.

If preclearance can be described as a way to create and facilitate trade, the corollary is that countries' capacity to enter and implement a cooperation agreement with APHIS for preclearance becomes a determinant of market access to the USA. Capacity is a crucial issue; however, as many exporters of agricultural products are developing countries, which suffer from budget constraints and sometimes lack of support by the government to the development of agricultural exports. Both factors can be an impediment to the implementation of preclearance measures[12][13].

In conclusion, measures such as the systems approach and cooperation agreements/pre-clearance, while offering in limited instances alternative options to exporters to access the USA market, do not appear to really ease to a significant extent the burden on countries seeking this access. SPS facilitation measures still impose significant implementation delays, added costs and constraints on exporters, and thus it looks doubtful that such measures are designed to truly facilitate trade across the board. In the absence of exact information on the use of the systems approach and preclearance, it is difficult to assess the added market access provided by these measures and come to a clear conclusion. However, in light of the evidence presented in the remainder of this paper, we see that additional access to the US market to new suppliers is actually limited. Facilitation measures seem driven by an extremely cautious opening of the US market in response to increased consumer demand for FF&V variety rather than unmitigated liberalization.

These measures also reveal two important traits of the promoters of the actual system:

(1) the opposition by domestic producers to measures that offer flexibility; and

(2) a conception of flexibility by the agencies that equates to indeed offer less rigid options but at greater compliance cost for foreign exporters.

3. Impacts of the US market access regime

This section presents empirical evidence on the impacts of the US market access regime for FF&V, as described in the previous section. It first presents a new database on market access, which forms the basis of the analysis. It then examines US market access and global production, and finally puts results in comparative perspective, by looking at market access in other main global players in agricultural trade. The analysis is based on descriptive statistics, not a full econometric analysis, and is therefore subject to the usual caveat regarding intervening causes.

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3.1 A database on US market access for fresh fruits and vegetables between 1994 and 2011

Beyond case-study evidence (including some persuasive contributions noted earlier), there is little systematic evidence available on the overall scope of US SPS measures and how they determine market access conditions. To remedy part of this information gap, we construct a database of access to the US market for the period of 1994-2011 for FF&V. This database lists which countries are actually exporting to the USA and which are authorized to export to the USA market. As mentioned earlier, the USA uses a positive list approach for phytosanitary protection when granting market access to its territory: by law, foreign FF&V are not allowed to enter the US market unless they have been expressly authorized.

Identifying which products have been cleared to enter the USA is actually a surprisingly complex task. As noted earlier, all new market access since 1992 requires an individual regulation or a notice-based process. As a result, all new market access appears in the Federal Register, as well as in the Code of Federal Regulation. However, products that were granted permits to export to the USA before 1992 were not always listed in the CFR. APHIS, the agency administering access to the US market for FF&V, tried to amend the regulation so as to add the missing products. However, it still refers to the list as "partial" in the last 2007 reform, preventing us from directly using this list for the construction of a market access panel database. We address this deficiency by using information available in the Fresh Fruits and Vegetables Import Manual FAVIR Database, which allows searching for currently authorized fruits and vegetables by commodity or country and provides information on general requirements for their importation[14].

We use Jouanjean's (2012) backward-looking method using the information available in the FAVIR database in 2011 as our baseline. We can then go back in time and remove products according to the date on which they became eligible according to Federal Registers. The U.S Government Printing Office makes all Federal Registers and Codes of Federal Regulation since 1994 accessible and searchable on-line[15]. We were therefore able to gather all APHIS-related notices: availability of a PRA, proposed and final rules for the importation of fruits and vegetables (grouped or standalone) and other amendments relative to products already eligible (changes in pest free areas, treatment or areas of accessibility in the USA). We also include in the database products that had once been granted access to the US market but which were subsequently removed. Those products do not appear in the 2011 FAVIR database. Lemons and other citrus from Argentina are an example. However, such situations are unusual.

Another issue is that neither the FAVIR database nor the Federal Register notices mention any product codes. Both instead refer to the product's scientific definition. Thus, to compare this database with UN-COMTRADE trade flows, we manually recoded all products according the HS 6-digit scheme.

We limit our analysis to the US continental market access. Many products that are not allowed into the continental USA are actually allowed into US territories and vice versa. Access to US territories represents very small trade flows but a non-negligible amount of commodity-country market access, and because of their geographical situation, they represent very different environments. We therefore exclude US territories from this analysis.

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The result of this data collection effort is a panel database of US market access for FF&V. It covers 57 products at the HS 6-digit level for 194 countries, for the period 1994-2011, for a total of 69,225 observations.

3.2 US market access and global production

We first proceed to counting eligibility to enter the US market to assess how open or closed the US market for FF&V is. Using data supplied by the USDA Economic Research Service, we list for key categories of FF&V the number of exporters eligible to enter the US market, and compare this with the actual number of exporters entering the USA for the year 2009. We also offer a comparison with the number of exporters to Europe (Tables I and II).

First, the number of countries eligible to enter the US market is often only a fraction of the world's production and export supply, although in a few cases (garlic, mushrooms, onions, grapes and strawberries), nearly all of the world's exporters have access to the USA. On the other hand, there are several instances where less than a third of the world's exporters in volume are allowed entry into the USA (artichokes, pumpkins and squash, sweet potatoes, apricots, cherries, dates, figs and peaches). Only 1 per cent of the world's exporters of figs and dates can ship to the USA.

Tables II and III also take product-level COMTRADE data and match it to market access eligibility from our database[16]. They show that the number of active exporters is generally lower than the number of eligible countries. This is to be expected to some extent because all eligible countries may not be able to export to the USA in a given year, depending on many factors such as prices, production and demand in other markets. However, in numerous instances, the number of actual exporters to the USA is much lower than the theoretical number of potential exporters: for instance, only three countries export cauliflower to the USA, four export spinach, four export strawberries and four export avocados. This is despite the fact that the US market is theoretically open to a large portion of the world's exports for these products. For avocado, one of the reasons is that, although a fairly large number of exporters seems to have access to the US market, this access is restricted to specific varieties of avocado and very few countries can export the most consumed Haas variety. Moreover, exports take place under stringent conditions and complex systems approaches, as previously mentioned for Mexico. It is important to note that this table makes the distinction between access to US territories and access to the continental US market.

We can infer that two levels of potential market access restrictions are at play from the above information. First, market access eligibility is available only to a small portion of the world's exporters. Second, actual market access is not even fulfilled by all those exporters that are eligible to export in the first place, suggesting possible further difficulties in complying with US requirements once market access eligibility is granted. Of course, the gap between actual and potential exporters could be explained by other factors, such as trade costs.

3.3 US fresh fruits and vegetables market access in comparative perspective

If the restrictiveness of the US FF&V market access system in fact inhibits countries from exporting, we would expect to see fewer exporters to the USA than to comparator markets with less restrictive systems, such as the EU with its negative list approach.

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Table II. Exports of fresh vegetables eligible for importation into the USA

Commodity	Countries eligible to export to the USA: Total no. of countries 2/	Countries eligible to export to the USA: No. of low- and middle-income countries 3/	Eligible production and exports as % of world total volume 1/: Production 4/	Eligible production and exports as % of world total volume 1/: Exports 4/	No. of eligible countries within top 10: Producers 4/	No. of eligible countries within top 10: Exporters 4/
Artichokes	32	24	26	24	4	2
Asparagus	38	23	6	70	3	3
Bell pepper	37	19	17	78	4	5
Broccoli and Cauliflower	51	23	12	56	4	8
Brussels sprouts	51	23	nd	nd	nd	nd
Cabbage and other Brassicas	55	23	13	46	2	7
Carrot	54	26	23	45	3	4
Celery	23	13	nd	nd	nd	nd
Cucumber	53	19	8	75	2	5
Eggplant	39	20	2	60	1	4
Escarole	7	3	nd	nd	nd	nd
Garlic	101	56	93	97	6	9
Green bean	47	24	17	57	4	5
Lettuce	51	23	15	67	3	5
Mushroom	126	70	98	98	9	9
Mustard greens	30	15	nd	nd	nd	nd
Okra	42	23	3	nd	1	nd
Onion	98	56	68	98	9	9
Potato	9	4	0	0	0	1
Pumpkin and squash	8	3	5	28	0	2
Radish	30	17	nd	nd	nd	nd
Spinach	37	17	7	0	3	3
Sweet corn	47	27	nd	nd	3	1
Sweet potato	25	8	2	15	1	2
Tomato	36	15	11	47	1	2
Turnip greens	21	13	nd	nd	nd	nd

(*continued*)

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Table II.

Commodity	2009 Exports to European Union and USA: 5/ No. of exporters to EU	EU imports in 1,000 USD	No of exporters to USA	US imports in 1,000 USD	HS Code
Artichokes	nd	nd	nd	nd	7,0910
Asparagus	30	161,066	10	500,923	7,0920
Bell pepper	75	407,926	21	993,246	7,0960
Broccoli and Cauliflower	27	2,963	3	10,569	7,0410
Brussels sprouts	10	2,201	3	7,396	7,0420
Cabbage and other Brassicas	39	20,899	10	169,220	7,0490
Carrot	35	37,973	6	56,679	7,0610
Celery	15	2,873	4	17,940	7,0940
Cucumber	27	35,489	8	393,502	7,0700
Eggplant	48	16,334	10	70,734	7,0930
Escarole	16	4,045	8	2,879	7,0529
Garlic	22	161,975	13	138,808	7,0320
Green bean	54	422,337	15	89,021	7,0820
Lettuce	19	8,857	5	79,118	7,0511
Mushroom	16	267	14	107,485	7,0951
Mustard greens	nd	nd	nd	nd	nd
Okra	98	298,303	31	470,404	7,0990
Onion	29	100,292	15	9,713	7,1220
Potato	15	851	9	1,661	7,1010
Pumpkin and squash			see okra		
Radish	36	6,261	18	21,692	7,0690
Spinach	25	3,343	4	10,708	7,0970
Sweet corn	18	11,856	13	25,918	7,1040
Sweet potato	37	53,945	12	9,486	7,1420
Tomato	44	572,364	12	1,879,534	7,0200
Turnip greens			see carrots		

Notes: nd = No data 1/represents an upper bound since FAO reports production and statistics for nations as a whole, although in some cases, only specific regions of a country may be eligible to export to the USA; 2/countries eligible to export each commodity to the USA as of June 2010 according to USDA animal and plant health inspection service regulations; 3/according to country classification developed by World Bank for 2010; 4/World production and export data for 2007 from the United Nations food and agriculture organization, FAOSTAT; 5/based on HS classification
Sources: Based on a table produced by the USDA, Economic Research Service, www.ers.usda.gov/Data/FruitVegPhyto/ and COMTRADE data

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Table III.
Exports of fresh fruits eligible for importation into the USA

Commodity	Countries eligible to export to the USA		Eligible country production and exports as a per cent of world total volume 1/		No. of eligible countries within top ten	
	Total number 2/	Low- and middle-income countries 3/	Production 4/	Exports 4/	Producers 4/	Exporters 4/
Apples	17	11	15	44	3	4
Apricots	10	6	5	5	1	0
Avocado	29	11	52	75	3	5
Bananas	75	48	31	73	4	6
Cantaloupe and Honeydew	44	19	18	88	3	8
Cherries	6	3	5	19	0	0
Cranberries and Blueberries	39	24	nd	nd	nd	nd
Dates	2	1	0	1	0	0
Figs	4	1	1	1	0	1
Grapefruit	43	23	39	45	2	2
Grapes	54	28	74	90	7	8
Kiwi	12	3	95	82	7	5
Lemons and Limes	59	31	40	69	4	6
Mango	27	16	61	82	5	9
Olives	2	1	0	0	0	0
Oranges	45	25	30	70	2	6
Papayas	32	20	37	71	3	5
Peaches	15	8	7	13	1	3
Pears	14	8	9	39	2	3
Pineapple	72	50	65	76	6	7
Plums	15	11	8	36	1	3
Raspberries and Blackberries	20	11	nd	nd	nd	nd
Strawberries	91	47	83	94	7	8
Tangerines	43	23	21	62	3	4
Watermelons	11	5	5	37	2	2

(*continued*)

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Table III.

Commodity	2010 Exports to European Union and USA: 5/ No. of exporters to EU	EU imports in 1,000 USD	No. of exporters to US	US imports in 1,000 USD	HS Code	Notes
Apples	32	730,134	9	212,700	8,0810	
Apricots	20	37,300	5	5,256	8,0910	
Avocado	33	403,682	4	616,536	8,0440	6/
Bananas	47	3,673,086	24	2,126,108	8,0300	6/
Cantaloupe and Honeydew	42	320,608	13	286,730	8,0719	
Cherries	20	174,699	9	82,987	8,0920	
Cranberries and Blueberries	28	122,987	12	453,966	8,1040	
Dates	42	187,357	16	18,503	8,0410	6/
Figs	31	144,278	14	14,742	8,0420	6/
Grapefruit	33	334,438	6	2,307	8,0540	6/
Grapes	34	1,329,021	10	1,464,390	8,0610	
Kiwi	17	282,393	8	71,672	8,1050	
Lemons and Limes	51	536,753	18	235,420	8,0550	
Mango	62	359,254	22	345,355	8,0450	8/
Olives	10	364	6	40,929	7,1120	7/
Oranges	45	740,952	16	119,182	8,0510	6/
Papayas	43	68,911	11	98,568	8,0720	6/
Peaches	23	69,257	4	85,256	8,0930	6/
Pears	26	351,206	8	96,323	8,0820	9/
Pineapple	43	746,987	21	585,167	8,0430	6/
Plums	25	124,162	10	49,392	8,0940	
Raspberries and Blackberries	25	263,497	21	79,868	8,1120	
Strawberries	23	89,784	4	225,506	8,1010	
Tangerines	34	393,824	11	252,103	8,0520	
Watermelons	35	84,484	8	268,153	8,0711	

Notes: nd = no data; 1/represents an upper bound since FAO reports production and statistics for nations as a whole, although in some cases, only specific regions of a country may be eligible to export to the USA; 2/countries eligible to export each commodity to the USA as of June 2010 according to USDA animal and plant health inspection service regulations. 3/according to country classification developed by World Bank for 2010; 4/World production and export data for 2007 from the United Nations Food and Agriculture Organization, FAOSTAT; 5/based on HS classification 6-digit; 6/fresh and dried; 7/including provisionally preserved; 8/including guava and mangosteen; 9/including quince

Sources: Based on a table produced by the USDA, Economic Research Service, www.ers.usda.gov/Data/FruitVegPhyto/ and COMTRADE data

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Using UN-COMTRADE trade flows at the HS 6-digit level, we compare the evolution of the number of active suppliers (measured at the country level) of FF&V in the world, to the number of active foreign exporters to the USA, a simple measure of whether access to the USA market has followed similar patterns to that of the rest of the world over recent years.

Figure 1 presents a simple average of the total number of suppliers per product across the products that are covered by the regulation governing access eligibility and listed in our market access database. Overall market access has increased significantly over the period, but there is a wide discrepancy of evolution between US market access and the rest of the world: while the average number of suppliers to the world has nearly doubled over the period, the average number of FF&V suppliers to the USA has, on the other hand, risen very slowly, even stagnating in the second half of the sample period. This comes somewhat as a surprise, as the USA reformed its admissibility system twice during this timeframe, and imports of FF&V to the country increased robustly over the period (Johnson, 2010).

There are two possible explanations for this observation. Either the US market was already more open to FF&V imports than other countries to begin with, or on the contrary, access to the US market for FF&V remains relatively more restricted or less accessible to new exporters. There are reasons to doubt the first explanation by simply looking at the number of exporters to the USA, which at about 10 on average seems low by any standard, and is far below the more than 110 countries on average exporting any FF&V across the world, which we take as approximating the maximum theoretical number of foreign suppliers to the USA.

Although these findings are indicative of significant market access difficulties in the USA, the possibility remains that this issue is not unique to that market, and that a similar situation prevails in the other main agricultural importers. Strict standards and regulations are after all common to most developed country markets, and the exactitude of US requirements is not the only source of complaints from prospective exporters.

A further comparison with the number of actual exporters to the EU 15 reveals that save for a handful of exceptions, exports to the EU 15 attract a far larger number of exporters than do exports to the USA (Figure 1 and Tables I andII). The difference is

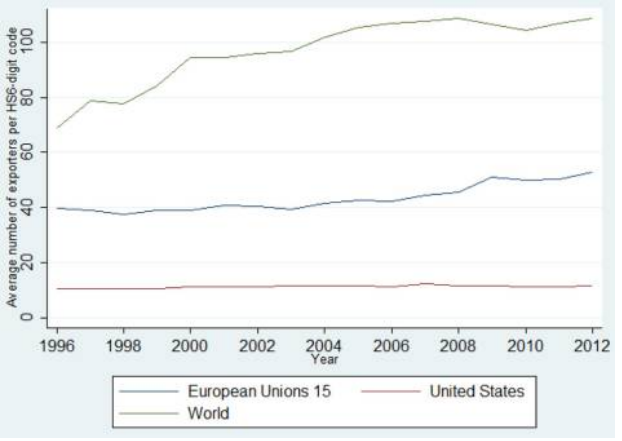

Figure 1.
Total number of countries exporting FF&V to the USA, the EU-15 and the world, averaged by HS 6-digit product

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sometimes enormous such as carrot exports, where 35 countries supply the EU 15[17] but only 6 do so to the USA. The comparison with the EU is especially interesting, as the EU 15 market is relatively similar in size, income and presumably consumer and producer preferences regarding the appropriate (high) level of health and plant standards. However, there are also important differences that could act as intervening causes. Areas in which the USA and EU 15 differ markedly include domestic production of fruits and vegetables, geographical access, historical ties with other producing countries and of course SPS systems. It would seem reasonable to assume that the USA having more areas of production of warm climate fruits and vegetables would have more domestic competition for imports. Although this is indeed a relevant factor, we see that even when US imports are equal to or significantly larger than EU ones in value, the number of suppliers is smaller: tomatoes, cucumbers, cranberries and blueberries offer relatively striking examples (Tables I and II). Even though it is true that the US market is further away from potential suppliers than the EU, geographical distance seems unlikely to be the sole relevant factor behind these significant differences in market penetration.

Furthermore, because we are also looking at a trend over a time period of nearly two decades in Figure 1, we have here a simple way to control for those factors not related to the SPS-regime that would affect the levels of access to each respective market (such as geographic distance, production conditions, common language and historical trading relations) that do not vary significantly over time[18]. Thus prima facie evidence suggests strongly that the difference in SPS systems, and in particular between the negative list approach favored by Europe and the positive one used by the USA, is probably a key factor.

To extend the comparative exercise, we next look at the number of suppliers to the US market and to three other Organisation for Economic Co-operation and Development countries: Canada, Australia and Japan (Table IV. Two of these countries have much smaller market sizes compared to the USA and Europe; Japan has an intermediate market size. We also know that two of these countries, Japan and Australia, have the reputation of being restrictive where agricultural products are concerned, at least in the case of SPS measures for Australia. The table seems to confirm this view: the number of exporters to Australia and Japan is often significantly lower and nearly systematically lower than comparable numbers for the USA. Although Australia is a smaller market – and also geographically distant – and so less likely to attract a large number of exporters, Japan is a large and rich market, so more exporters are expected. This may be indicative that market access to the USA, although complex, is not the most restrictive out there.

More telling, however, is the comparison with Canada, which is closely related to the USA in terms of preferences and geographical access. Despite the many similarities between the two markets, the number of exporters to Canada is much higher than to the USA, notwithstanding the former's smaller market size. Arguably, Canadian agricultural production is unlikely to compete with imports in some of these sectors. Nonetheless, the number of exporters to Canada is often comparable to the number serving the EU market, which may be indicative of an SPS regime that achieves similar objectives.

Finally, we seek to investigate how newly granted market access shapes the distribution of imports across origins. To do so we measure how new "entrants" (defined

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Table IV.
Import patterns in USA and comparison markets

HS Code	Product description	Australia No.	Australia Value in 1,000 USD	Canada No.	Canada Value in 1,000 USD	EU No.	EU Value in 1,000 USD
80300	Bananas, including plantains, fresh	10	757	53	354,614	47	3,673,086
80610	Fresh grapes	1	19,156	27	391,660	34	1,329,021
70200	Tomatoes, fresh or chilled	1	4,272	34	302,014	44	572,364
70960	Fruits of *Capsicum* or of	1	7,369	51	215,793	75	407,926
80430	Pineapples	4	673	34	97,402	43	746,987
80440	Avocados	1	34,223	30	80,209	33	403,682
80510	Oranges	4	21,775	36	174,293	45	740,952
80810	Apples			21	184,223	32	730,134
71080	Other vegetables	24	16,092	43	42,878	57	354,339
70990	Other vegetables	6	685	71	146,848	98	298,303
80550	Lemons and limes	5	10,609	50	69,240	51	536,753
80620	Grapes, dried	14	41,641	25	72,143	33	682,670
80520	Mandarins (including tangerines and Satsuma)	4	3,470	36	166,036	34	393,824
80450	Guavas, mangoes and mangosteens	12	2,230	51	62,879	62	359,254
70920	Asparagus	9	8,386	33	73,860	30	161,066
71140	Cucumbers and gherkins	4	1,698	7	1,089	10	29,123
71332	Small red (Adzuki) beans (Phaseolus)	5	1,305	15	2,022	24	3,288
71390	Other dried, shelled leguminous vegetables	14	655	38	5,298	49	7,307
71010	Potatoes	7	312	10	1,159	15	851
70110	Seed			2	3,000	10	544
70890	Other leguminous vegetables	2	31	19	2,956	43	8,346
71232	Wood ears (Auricularia spp.)	3	286	10	281	11	4,618
71231	Mushrooms of the genus *Agaricus*	7	412	19	2,362	16	8,363
71350	Broad beans (*Vicia faba* var. major)	2	9	19	363	30	10,282
70529	Other fresh of chilled chicory			20	5,054	16	4,045
70420	Brussels sprouts			11	8,071	10	2,201
80590	Other fresh or dried citrus fruit	4	96	33	1,470	33	6,778
70521	Witloof chicory (*Cichorium intybus*			5	1,338	3	46
81060	Durians	2	55	4	1,294	3	2,541
71151	Mushrooms of *Agaricus*			3	27	1	1,498
71233	Jelly fungi (Tremella spp.)	2	53	3	300	7	749

(*continued*)

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Table IV.

HS Code	Product description	Japan No.	Japan Value in 1,000 USD	USA No.	USA Value in 1,000 USD	Product type
80300	Bananas, including plantains, fresh	10	844,749	24	2,126,108	*15 most imported products*
80610	Fresh grapes	5	28,371	10	1,464,390	
70200	Tomatoes, fresh or chilled	5	11,900	12	1,879,534	
70960	Fruits of *Capsicum* or of	5	111,045	21	993,246	
80430	Pineapples	9	101,403	21	585,167	
80440	Avocados	4	120,702	4	616,536	
80510	Oranges	6	125,778	16	119,182	
80810	Apples	1	340	9	212,700	
71080	Other vegetables	32	259,753	44	465,368	
70990	Other vegetables	18	116,383	31	470,404	
80550	Lemons and limes	5	86,402	18	235,420	
80620	Grapes, dried	11	73,828	20	37,570	
80520	Mandarins (including tangerines and Satsuma)	6	16,421	11	252,103	
80450	Guavas, mangoes and mangosteens	13	47,130	22	345,355	
70920	Asparagus	15	74,951	10	500,923	
71140	Cucumbers and gherkins	7	15,554	8	6,252	*15 least imported products*
71332	Small red (Adzuki) beans (Phaseolus)	8	26,215	19	9,743	
71390	Other dried, shelled leguminous vegetables	6	470	20	26,170	
71010	Potatoes	7	23,337	9	1,661	
70110	Seed			2	22,890	
70890	Other leguminous vegetables	2	2,948	12	10,596	
71232	Wood ears (Auricularia spp.)	3	19,256	1	358	
71231	Mushrooms of the genus *Agaricus*	3	193	17	11,755	
71350	Broad beans (*Vicia faba* var. major)	9	7,404	16	3,865	
70529	Other fresh of chilled chicory	3	6,769	8	2,879	
70420	Brussels sprouts	4	108	3	7,396	
80590	Other fresh or dried citrus fruit	2	8	11	1,977	
70521	Witloof chicory (*Cichorium intybus*	3	2,258	8	5,108	
81060	Durians	1	495	1	2,323	
71151	Mushrooms of *Agaricus*	1	2,496	1	32	
71233	Jelly fungi (Tremella spp.)	1	696	1	47	

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here as country of origin; entrants are actually firms that are exporting to the USA) fare in terms of the share of total exports to the USA. For this, we calculate the concentration of shares of total exports using the Hirschman Herfindahl Index (HHI), a widely accepted and simple measure of concentration: the lower the HHI index, the lower the concentration[19]. The evolution of the average HHI across all FF&V for exporters to the USA and the EU is presented in Figure 2. The figure is interesting in several respects. We first see a decrease of the average HHI index in the USA. This is not really a surprise, as we know that market access has been granted to more countries over the period and more exporters would mean that exports to the USA are distributed over a larger number and thus likely to translate into less concentration of import market shares. We see also that the decrease in the HHI (lesser concentration of exports) is more important for the USA than for Europe. However, the USA was starting from a much lower base and still its HHI index shows only a modest improvement, from about 0.65 to 0.58 (in 2002, the HHI actually increases again). The gap compared to Europe is still very significant, with Europe having an average HHI of 0.29 in the lowest year. To give an order of comparison, if two exporters have equal market share of 50 per cent of exports, the HHI would be 0.5. An HHI of 0.6 means that one of the exporters has at least a market share of 72 per cent, which in the absolute is very high. The conclusion is that, as the index for the USA does not fall that much, and remains at a very high level, exporters with already a large share of exports to the USA do not lose that much market share to new entrants. This suggests niche entry and may also suggest that the SPS system is so strict that it allows only marginal varieties. For instance, Haiti, a leading producer of mangoes, has only one variety (called Madame Francisque) accepted into the USA, among many varieties produced there.

4. Does lobbying play a role in determining fresh fruits and vegetables market access?

The previous section provided suggestive evidence that the US market access regime for FF&V is relatively restrictive, both in terms of the proportion of global production that is authorized to enter the country and in relation to comparator markets. In theory at least, the US system is set up for public good reasons: the prevention of damage from

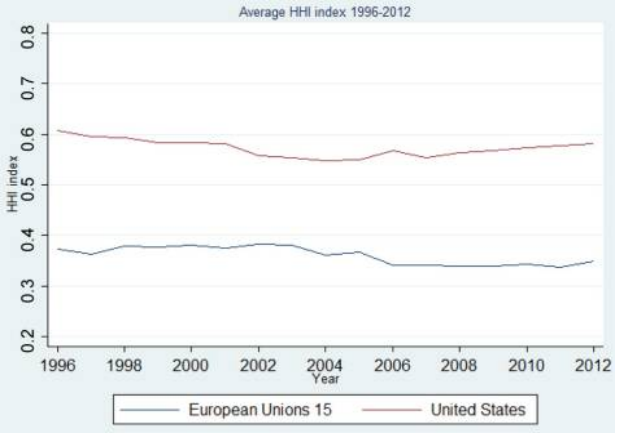

Figure 2.
Evolution of average concentration of exporters to the USA for all FF&V (1994-2012)

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quarantine pests. However, the complexity of the eligibility system means that it is possible for political economy considerations to play a role at various stages in the process, as demonstrated by case studies such as Hass avocadoes and Argentinean citrus. Using the FF&V market access database described in the previous section and data on political economy variables, this section presents some suggestive evidence to the effect that lobbying is indeed a factor in the determination of the grant of market access. The US FF&V market access system appears to be about protectionism and protection.

A first piece of evidence comes from data on political contributions as an indicator of lobbying behavior. Grossman and Helpman (1994) show that protection rates should be higher in organized industries – i.e. those with lobbies – than in unorganized ones. Empirical tests of the Grossman and Helpman (1994) model such as Goldberg and Maggi (1999) and Gawande and Hoekman (2006) in the agricultural context, use sectoral political contributions as a proxy for the existence of a lobby: sectors with positive contributions are considered to be organized, and those with zero contributions are considered to be unorganized. We adopt that approach here, using data on political contributions from Political Action Committees database made available by the US Federal Action Commission (FEC). The database lists each committee registered with the Federal Election Commission and their spending. Data from 2007 were downloaded from the FEC website. Among committees specifically relating to agriculture and in particular to the FF&V sector, we can identify two types of organizations. The first relates to farm bureaus, cooperatives or lobby groups on FF&V at large. We do not have the necessary information to know whether those lobbies were directing their action toward any specific product at the HS 6-digit scale. Therefore, information on those PACs can only be used in empirical analysis at more aggregated levels. The second type of lobby is much more specific and relates to a restricted set of HS 6-digit products or even sometimes to one single product line. Only this set of PACs is considered in this analysis. The data are mapped to the HS 6-digit product lines in the market access database.

Given that the USA adopts a positive list approach to FF&V market access, it would be evidence of political economy effects at play if the number of approved countries were to be lower in organized sectors than in unorganized ones. Indeed, that is exactly what we find in the data. Table V shows descriptive statistics for organized and unorganized sectors in 2007. We find that, on average, only about half as many countries are approved exporters to the USA in organized sectors compared with unorganized sectors. The difference between the two means is statistically significant at the 1 per cent level, based on a *t*-test. To show that the difference in means is not solely a function of skewness in the distributions, we also compare medians: for organized sectors, the median number of authorized exporters is 22, whereas for unorganized sectors, it is 46. The difference of medians is again statistically significant at the 5 per cent level. The

Table V.
Descriptive statistics for the number of authorized exporters to the USA in FF & V sectors, 2007

Observation type	Average	SD	Minimum	Maximum
With political contributions	28.667	22.157	2.000	76.000
Without political contributions	58.258	42.275	1.000	225.000

Notes: *t*-Test of equal means: 2.940, $p = 0.998$; Chi-2 ^{2} test of equal medians: 6.470, $p = 0.011$

range for organized sectors is also much narrower, with a maximum of only 76 countries compared with 225 for unorganized sectors. All of these descriptive statistics support the view that political economy plays a role in the determination of market access for FF&V in the USA.

The political economy literature outside the Grossman and Helpman (1994) framework identifies other variables that can be indicators of lobbying activity. One possibility is the concentration of production across firms (farms), on the theory that a higher degree of concentration is more likely to give birth to lobbying activity because it is easier for a small number of large operators to overcome the transaction costs involved in establishing a lobby. Based on this approach, we would expect to see a negative correlation between farm-level production concentration (sourced from the US Census Bureau)[20] and the number of countries with market access to the USA in FF&V sectors. Figure 3 shows that this is exactly what the data suggest: the line of best fit is downward sloping, and the negative correlation is statistically significant at the 10 per cent level.

5. Conclusion and policy implications

This paper has shown that US phytosanitary measures that are primarily designed to protect plants from pests represent a significant market access barrier in the FF&V sector, particularly for developing countries where the human, technical and financial resources needed for compliance may be lacking. US market access is restricted in terms of the number of countries authorized to export FF&V: the evolution over time of new entry into the US market has been slow, and far fewer countries are allowed to export FF&V to the USA than to comparable third markets, such as the EU, or even Canada. Although traditional trade policies and geographical factors also play some role in the number of exporters actively engaged with different markets, the preliminary evidence suggests that phytosanitary measures also play an important role. In particular, the "positive list" approach applied by the USA – which bans all FF&V imports except from explicitly authorized countries – amounts to a costly and often prohibitive non-tariff barrier for many developing country exporters.

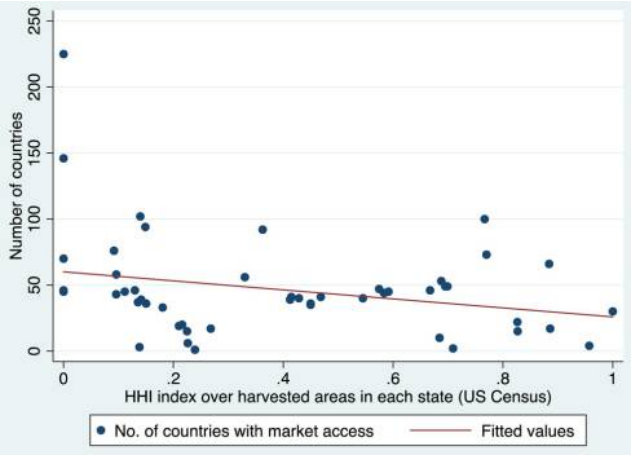

Figure 3.
Correlation between market access eligibility and farm-level concentration of production in the USA

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One important caveat to our results is that we do not observe the "chilling effect" of the US regime, namely, the way in which it discourages potential exporters from even applying for market access. Similarly, we do not observe applications that were made but which failed. We only observe the final outcome, which is the number of countries that have market access as of a particular date. With those constraints in mind, the data nonetheless show a significant market access problem in the sectors covered by the US phytosanitary measures.

We have also shown that one potential explanation for the restrictiveness of the US regime in practice is the considerable space it leaves for the intrusion of domestic political economy considerations into what should be a process driven primarily by science. There is considerable anecdotal evidence on this point already, such as the role of US producers in restricting market access for Mexican avocadoes and Argentinean citrus. This paper has provided suggestive, but systematic, evidence that market access tends to be more restricted in sectors that make political contributions as opposed to those that do not. It has also demonstrated a negative correlation between domestic production concentration at the farm level, and the number of foreign producing countries granted access by US authorities. Both pieces of evidence tend to suggest that organized sectors may be using the phytosanitary regime as a way of insulating themselves from foreign competition – an outcome that is quite contrary to the spirit of the SPS Agreement.

Although the policy debate on SPS measures has primarily focused on those instruments designed to protect human health, the present paper suggests that the discussion needs to be broadened to include phytosanitary measures as well. Indeed, developing country exporters often indicate that plant protection issues represent more of a barrier to their exports than food safety concerns. Future research could usefully explore this issue, focusing in particular on the strategies successful developing country exporters have adopted to deal with phytosanitary concerns in developed country markets, including the USA.

Notes

1. In the remainder of the text, we will use the term "pest" to include both pests and pathogens, unless otherwise specified.
2. Conducted by Jouanjean in November-December 2009.
3. As opposed to traditional exports such as bananas and sugar. This expression is often used to talk about new high-value agricultural exports, mostly horticultural products.
4. It is beyond the scope of this paper to examine the interesting legal question of whether the US system complies with the SPS Agreement, and other relevant WTO obligations.
5. See for instance: www.aphis.usda.gov/publications/plant_health/content/printable_version/faq_q56reg.pdf
6. After a PRA is conducted (see section below).
7. In one description (Ghana's experience, see footnote 9) it is indeed suggested that APHIS had a backlog of PRA of two to three years.
8. See, for instance, the experience of Ghana presented at the International Plant Health Risk Analysis Workshop, IPPC, 2005. www.ippc.int/core-activities/capacity-development/

working-groups/international-plant-health-risk-analysis-workshop24-28-october-2005-niagara-falls-canada

9. The standard in the USA for pests is the so-called Probit-9 security, requiring that 99.9968 per cent of pests to be killed by the treatment.
10. More generally, see National Plant Board (2002) for a thorough description of the systems approach. See also Stewart and Schenewerk (2004) for a discussion of the systems approach for citrus from Argentina.
11. USDA APHIS (2004). No more up-to-date voluntary list is available. The list can be accessed at: www.flegenheimer.com/documents/aphis.pdf (accessed 26 April 2014).
12. In the Philippines, an article from the press assesses the running cost (i.e. not including establishment of the treatment facility) of inspection for mangoes, including the presence of three APHIS inspectors, is quoted to amount to over $142,000 for a period of five months in 2007: www.gmanews.tv/story/32476/US-importers-look-to-less-costly-RP-mangoes
13. In Haiti, in the early 1990s, Haitian mangoes' exporters formed a national association of mango producers. One of the main functions of the association is to coordinate and raise funds for the hot water bath treatment required by APHIS.
14. www.aphis.usda.gov/favir/info.shtml (accessed 22 June 2011).
15. www.gpo.gov/fdsys/browse/collectionCfr.action?collectionCode=CFR
16. We use HS6 data which are not perfectly matched to FAOSTAT data. Note, for instance, that some HS6 codes include dried fruits, which explains why we count 14 and 16 countries exporting to the USA when only 4 and 2, respectively, are allowed for the fresh fruit.
17. Excluding intra-EU trade.
18. While production conditions do indeed vary over time, some fundamental endowments such as historical climate land characteristics remain stable. Climate conditions have probably changed over the period but likely in many different ways for the various products we examine so that we can consider it not affecting the difference between the two trends.
19. We calculate $HHI = \sum (X_i/X_w)^2$ where X_i and X_w are country i's export and total exports to the USA, respectively.
20. www.census.gov/

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References

Baldwin, R.E. (1988), "Hysteresis in import prices: the beachhead effect", *The American Economic Review*, Vol. 78 No. 4, pp. 773-785.

Carman, H.F., Li, L. and Sexton, R.J. (2006), "Impact of sequential and partial trade liberalization for Mexican Hass avocado imports to the United States during 1998-2004", paper presented at AAEA Annual Meeting, Long Beach, CA, 23-26 July.

Cororaton, C.B., Orden, D. and Peterson, E. (2011), "Economic impact of potential US regulatory decisions concerning imports of Argentine Lemons", GII Working Paper No. 2011

European Commission (2006), "Guidance document on certain key questions related to import requirements and the new rules on food hygiene and on official food controls", *Health & Consumer Protection Directorate-General*, European Commission, Brussels.

Federal Register (2006), *Proposed Rules*, Vol. 71 No. 81, 26 April.

Federal Register (2007), *Rules and Regulations*, Vol. 72 No. 137, 18 July.

Downloaded by Izmir Institute of Technology At 00:01 19 October 2016 (PT)

Food and Agriculture Organisation (FAO) (2002), "International standards for phytosanitary measures (ISPM)", *The Use of Integrated Measures in a Systems Approach for Pest Risk Management*, No. 14.

Gawande, K. and Hoekman, B. (2006), "Lobbying and agricultural trade policy in the United States", *International Organization*, Vol. 60 No. 3, pp. 527-561.

Goldberg, P. and Maggi, G. (1999), "Protection for sale: an empirical investigation", *American Economic Review*, Vol. 89 No. 5, pp. 1135-1155.

Grossman, G. and Helpman, E. (1994), "Protection for sale", *American Economic Review*, Vol. 84 No. 4, pp. 833-850.

Henson, S. and Jaffee, S. (2004), "Standards and agro-food exports from developing countries: rebalancing the debate", Policy Research Working Paper No. 3348, World Bank.

IPPC (2005), "International plant health risk analysis workshop", available at: www.ippc.int/core-activities/capacity-development/working-groups/international-plant-health-risk-analysis-workshop24-28-october-2005-niagara-falls-canada

Johnson, R. (2010), *The US Trade Situation for Fruit and Vegetable Products*, Congressional Research Service 7-5700.

Jouanjean, M.A. (2012), "Market access and food standards: insights from the implementation of US sanitary and phytosanitary regulations", PhD dissertation, Sciences Po Paris.

Jouanjean, M.A., Maur, J.C. and Shepherd, B. (2012), "Reputation matters: spillover effects in the enforcement of US SPS measures", Policy Research Working Paper No. 5935, World Bank.

Karov, V., Roberts, D., Grant, J.H. and Peterson, E.B. (2009), "A preliminary empirical assessment of the effects of phytosanitary regulations on US fresh fruit and vegetable imports", available at: http://purl.umn.edu/49345

Karp, D. (2006), "From Silk Road to supermarket, China's Fragrant Pears", *The New York Times*, 15 November.

Kee, H.L., Nicita, A. and Olarreaga, M. (2009), "Estimating trade restrictiveness indices", *Economic Journal*, Vol. 119 No. 534, pp. 172-199.

Lamb, R.L. (2006), "Rent seeking in US Mexican avocado trade", *Cato Journal*, Vol. 26 No. 1, pp. 159-177.

McLean, M. (2004), "The impact of international phytosanitary requirements on the lemon industry in Tucumán", Working Paper.

Maertens, M. and Swinnen, J.F.M. (2009), "Trade, standards, and poverty: evidence from Senegal", *World Development*, Vol. 37 No. 1, pp. 161-178.

Miller, A.J. (2006), "Opportunities and requirements to export Thai food and agricultural products to the US", Working Paper.

National Plant Board (2002), "Preventing the introduction of plant pathogens in the United States: the role and application of the systems approach", *A Scientific Review*, The National Plant Board for The United States Department of Agriculture Animal and Plant Health Inspection Service Plant Protection and Quarantine.

Orden, D., Narrod, C. and Glauber, J.W. (2001), "Least trade-restrictive SPS policies: an analytic framework is there but questions remain", in Anderson, K., McRae, C. and Wilson, D. (Eds), *The Economics of Quarantine and the SPS Agreement*, Centre for International Economic Studies, Adelaide.

Otsuki, T., Wilson, J. and Sewadeh, M. (2001), "What price precaution? European harmonization of aflatoxin regulations and African groundnut exports", *European Review of Agricultural Economics*, Vol. 28 No. 3, pp. 263-284.

Peterson, E.B. and Orden, D. (2008a), "Avocado pests and avocado trade", *American Journal of Agricultural Economics*, Vol. 90 No. 2, pp. 321-335.

Peterson, E.B. and Orden, D. (2008b), "Risk and economic assessments for US imports of Mexican avocados", *Journal of International Agricultural Trade and Development*, Vol. 4 No. 1, pp. 17-34.

Roberts, D. and Orden, D. (1997), "Determinants of technical barriers to trade: the case of US phytosanitary restrictions on Mexican avocados, 1972-1995", in Orden, D. and Roberts, D. (Eds), *Understanding Technical Barriers to Agricultural Trade*, University of Minnesota, Department of Applied Economics, International Agricultural Trade Research Consortium, St. Paul, MN.

Romano, E. (1998), "Two essays on sanitary and phytosanitary barriers affecting agricultural trade between Mexico and the United States", PhD dissertation, VA Polytechnic Institute and State University, VA.

Salop, S.C. and Scheffman, D. (1983), "Raising rival's costs", *American Economic Review*, Vol. 73 No. 2.

Stewart, T.P. and Schenewerk, C.B. (2004), "The conflict between facilitating international trade and protecting US agriculture from invasive species: APHIS, the US plant protection laws, and the argentine citrus dispute", *The Florida State University Journal of Transnational Law & Policy*, Vol. 13 No. 2, pp. 305-346.

Thornsbury, S. and Romano, E. (2007), "Economic evaluation of SPS regulations: where can progress be made?", Department of Agricultural Economics Staff Paper 2007-07, MI State University, MI.

USDA (2002), *Commodity Preclearance Program Management Guidelines*.

USDA APHIS. (2004), "Aphis preclearance programs", available at: www.aphis.usda.gov

WTO Committee on Sanitary and Phytosanitary Measures (2011), *Specific Trade Concerns, Issues not Considered in 2010*, available at: G/SPS/GEN/204/Rev.11/Add.2 (accessed 1 March 2011).

Further reading

Huang, S. and Huang, K. (2007), *Increased US Imports of Fresh Fruit and Vegetables*, Economic Research Service, USDA, FTS-328-01.

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