Methods of Measurement of Non-tariff Barriers in the International Textile Trade

Aida Zigmantavičienė, Vytautas Snieška

Kauno technologijos universitetas
Laisvės al. 55, LT-44309, Kaunas

Modern international trade is in the process of constant liberalization in goods and services: now when tariff barriers have been substantially reduced or eliminated there has been an increasing interest in the ways that non-tariff barriers might restrict or distort international trade and its dynamic. The policy of trade liberalization is changing the picture of world import and export trade.

The end of quotas and import taxes are bringing to a finale a process of liberalization that started in 1995 with the aim of integrating the textile and clothing sector into GATT. The main emphasis of it was to gradually reduce quotas as the most influential non-tariff trade barrier within 10 years period of time ending in January 1, 2005. Furthermore, the traditional non-tariff barriers to trade found replacement by modern trade distortions.

The article studies different methods to measure non-tariff barriers and analyses those most suitable to indicate the influence of non-tariff barriers in the international textile trade.

At first the article presents one of the most frequently used classification (typology) of non-tariff barriers employed to control international trade and introduces general methods for measuring the presence or size of non-tariff barriers. The main part of the study is dedicated to those trade restrictions most efficient in the context of international textile trade: quantity impact measures, frequency measures and price comparison measures.

The analysis of the main methods of measurement of non-tariff barriers as well as the summary of the findings from the other researches brings to the conclusion that regardless of a number of difficulties the theoretic and empiric analysis has developed and opens the opportunity for the theoretic and empiric analysis has developed and opens the opportunity to choose a corresponding trade policy to protect separate industries. It also admits that estimating tariff and subsidies equivalents and comparing them with price changes before and after the introduction of a barrier might be the best method of measurement of non-tariff barrier.

The empiric test is carried out in order to prove this proposition. The object of the research – the comparable analysis of consumer prices indexes including clothing and shoes in Norway, Sweden, representing European Union and USA. The outcome of the research confirms that gradual reduction of tariff rates in the international textile trade 1995-2004 is proportional to the drop in prices on textile and clothing products.

Acknowledging difficulties the article concludes that there is no the only best method absolutely efficient for measuring the presence or size of non-tariff barriers in textile and clothing sector. Every method discussed in the study depending on the aim of measurement of non-tariff barriers might be used.

Keywords: measurement of non-tariff barriers, international textile trade.

Introduction

Scientific papers provide a variety of different methods for the measurement of non-tariff barriers to international trade.

Clothing is one of the basic human needs and its international trade is one of the oldest. Along with food, it is also the subject to artificial distortions. Nevertheless (regardless to) the non-tariff barriers in agriculture have been investigated much wider and deeper. For instance, Papillon (1994) presents the modified price-gap method to estimate the tariff equivalent of the Canadian cheese import quotas. Becker (1997) investigates the measurement of technical barriers in agricultural trade, Sanders, Moulton, Paggi, Goodwin examine the influence of international agreements on the agricultural sector of an individual state – United States of America. Scientific sources (Stephenson (2001), Marko M. (1998), Brown, Stern (1999), Yama-zawa (1996), Bosworth,Findlay, Trewin, Warren (1997)) present a number of researches in the measurement of non-tariff barriers in service sector.

The aim of this article – to analyze the most frequently used methods of measurement of non-tariff barriers in the context of international textile trade.

The object of the paper – non-tariff barriers in international textile and clothing trade.

The methodology of the research – analysis of scientific resources and working papers, evaluation of different approaches and market practices taking into account modern tendencies of barriers to the international trade, empiric comparative analysis.

The broadest definition of a non-tariff barrier is any measure other than a tariff that distorts trade (Linkins, 2002). There are no problems to measure tariff barriers to trade because of their defined size but it’s not a case with non-tariff barriers because of the lack of actual, precise data.

United Nations Conference on Trade and Development (UNCTAD) trade analysis and information system provides a comprehensive list of non-tariff barriers classified according to trade control measures. The measures fall into five broad categories:

- price control measures: administrative pricing (minimum import prices, administrative pricing, voluntary export price restrain (variable levies, variable
components, compensatory elements, flexible import fees, variable charges), antidumping measures (anti-dumping investigations, duties, price undertakings),

- finance measures: advance payment requirements (advance import deposit, cash margin requirement, advance payment of customs duties, refundable deposits for sensitive product categories, multiple exchange rates, restrictive official foreign exchange allocation (prohibition of foreign exchange allocation, bank authorization, transfer delays, queuing),

- quantity control measures:
  - non-automatic licensing (license with no specific ex-ante criteria, license for selected purchasers, license for specified use, license linked with local production (purchase of local goods, local content requirement, barter or counter trade), license combined with or replaced by special import authorization, prior authorization for sensitive product categories, license for political reasons,
  - quotas: global quotas (unallocated, allocated to exporting countries), bilateral, seasonal, link with export performance, linked with purchase of local goods, quotas for sensitive product categories, for political reasons,
  - prohibitions: total, seasonal, temporary prohibition, suspension of issuance of licenses, import diversification, prohibition for political reasons (embargo), etc.,
  - export restrain arrangements: voluntary export restrain arrangements, multibre arrangement (MFA): quota agreement, consultation agreement, administrative co-operation agreement, export restraint, etc.,
  - enterprise-specific restrictions: selective approval of importers, enterprise-specific quota,

- monopolistic measures: single channel for imports (state trading administration, sole importing agency), compulsory national services (compulsory national insurance, transport),

- technical measures:
  - technical regulations: requirements for product characteristics, marking, labeling, packaging, testing, inspection and quarantine, information, requirement to pass through specified customs, etc.,
  - pre-shipment inspection, special customs formalities, return obligation.

Scientific resources provides various methods developed to estimate the non-tariff barriers and their economic effect. This survey focuses on the analysis of general methods for measuring non-tariff barriers in the context of textile international trade.

**Overview and estimation of methods for measuring non-tariff barriers in the context of international textile trade**

**General methods of measurement of non-tariff barriers.**

Researchers (Deardoff, 1997, Linkins, 2002) have used a number of methods for measuring the presence or size of non-tariff trade barriers:

- quantitative restraints, quantity-impact measures,
- frequency measures,
- price comparison measures,
- estimation of tariff or export tax equivalents,
- quantity measures,
- limitations related to the use of quota license prices.

**Quantitative restraints, quantity-impact measures.**

The simplest and most direct form of non-tariff trade barrier is a quota – direct quantitative restriction on the number of units of a good that can be imported during a specified time period. It may look like this barrier as well as other quantitative restraints has enough sufficient direct data to measure it. In the theory (Linkins, 2002), a quota or voluntary export restraint is not considered binding until the utilization rate for the particular measure reaches 100 percent. In other words, import levels bellow 100 percent are the equivalent of what would prevail under free-trade conditions. In addition, uncertainty on the part of suppliers regarding the permanency of the level of a particular restraint may also result in lower utilization rates.

Lithuanian textile and clothing industry eliminated quotas starting with 1998 and therefore there is no information about testing this model in Lithuania case (Snieška, 2002). However Linkins (2002) presents a picturesque illustration how five biggest MFA suppliers utilize USA quotas according International Trade Agreement, table 1. MFA quotas control the quantity of imports entering the United States on product basis. In general, when exports of products covered by a quota reach the quantity limit specifies by the agreement, no additional products can enter the country.

**Table 1**

<table>
<thead>
<tr>
<th>Country</th>
<th>Number of quota categories covered by agreement</th>
<th>Quota utilization rate greater than or equal to:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>80%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>number of quota categories</td>
</tr>
<tr>
<td>Hon Kong</td>
<td>147</td>
<td>124</td>
</tr>
<tr>
<td>China</td>
<td>147</td>
<td>130</td>
</tr>
<tr>
<td>Taiwan</td>
<td>141</td>
<td>140</td>
</tr>
<tr>
<td>South Korea</td>
<td>141</td>
<td>85</td>
</tr>
<tr>
<td>Philippines</td>
<td>141</td>
<td>48</td>
</tr>
</tbody>
</table>

*Source: Linkins, 2002.*
Researchers assume that quotas are binding when utilization rates reach 90% and more. Researchers also consider quantitative restraint method as helpful to measure how much non-tariff barriers reduces the trade volume.

Unfortunately, while the quantity that is imported under non-tariff barriers is observable, there is usually no other quantity against which to compare it. A general approach to measurement of the quantity effects of non-tariff barriers is possible using either a cross-country or a cross-country regression model to explain trade (Deardoff, 1997). But again, there is need to estimate what trade would have been in the absence of non-tariff barriers and to compare this to the trade that actually occurs. Researchers developed a satisfactory model of the determinants of trade as well as data covering a sufficient variety of trading situations. The model should imitate a circumstances in which trade is considered as free. Deardoff (1997), Chen (2003) presents a few scientific approaches: Heckscher-Ohlin, Helpman-Krugman and Gravity Model of international trade.

Gravity model of international trade is widely used as a basic model to evaluate the impact of trade policy to regional trade groups, currency unions, etc. In terms of international trade, the gravity model indicates the size of trade flows between two countries defined by supply conditions in one and demand conditions in the other as well as trade stimulation or restriction between different countries.

Okubo (2003) uses Gravity Model to analyze the border effect in the Japanese market. The results suggest that border effect in Japan is much lower than in the United States and Canada. Possible reasons for that is the reduction of tariff and non-tariff barriers, large foreign direct investments and the appreciation of the yen. Chen (2003) estimating border effect among EU countries reports that technical barriers to trade, together with product-specific information costs, increase border effects whereas non-tariff-barriers are not significant.

Two Swedish economists Eli Heckscher and Bertil Ohlin developed the theory of international economics based on proposition that international trade is essentially stimulated because of differences in resources between countries. Krugman (2003) defines Heckscher-Ohlin model as relationship between production factors in different countries and different goods produced by them. The model is also called factor-relationship theory. Yarbrough (1988) refers to this theory and states, that in free trade case the country would export the goods whom to produce it has comparative advantage and will import the goods whose production is caused by relatively poor production factors.

Chen (2003) connects different scientific approaches and states quantitative restraints measurement rests on all three econometric models, based on the standard trade model definition: Heckscher-Ohlin where trade is stimulated by comparative advantage, Helpman-Krugman model, where trade is stimulated by product differences and Gravity Model where the main emphasis is on comparison of trade partners (countries, companies, etc.)

Summarizing different approaches, non-tariff barriers to trade in terms of quantity impact measures may be measured in two ways:

- as a difference between the real and forecasted trade volume,
- using different imitative variables (Deardoff, 1997).

Referring to a diversity of textile products and their qualities, it might be very complicated to apply the second model to measure the non-tariff barrier but it could be rather precise method compared to the first one.

**Frequency-Type Measures**

Frequency measures are based on capturing changes in government trade policies and comparing trade policies on a country by country basis. The following methods are most frequently used:

- frequency ratio,
- import coverage ratio.

According to Movchan (2003), frequency measures are intensively explored by UNCTAD as the most transparent and universal. Stephenson (2001) stresses that frequency type measures indicate the presence of non-tariff barriers in terms of product, demonstrates penetration of non-tariff barriers and highlights the most effected products.

Using frequency type method, the following aspects should be indicated: size, kind and trade restriction by non-tariff barriers, frequency of trade partners complains and state report. The statistical data is provided by official national reports. The main three indexes should be taken into account:

- volume of the import of the country having no such non-tariff barrier comparing with the size of import of other trade partners exploring such trade restrictions,
- country based import volume compared with world imports,
- consumer goods trade flow index: country based and its trade partners based.

Frequency measure method serves to identify a kind of trade restriction and the size of protection in terms of different countries and sectors, including textile.

The method may be explored to measure non-tariff barriers in international textile trade as there is the possibility to access statistic data for different countries, however variety of trade barriers in different countries cause difficulties.

**Price-change measures** are based on price difference “with” and “without” trade barrier. The method allows a direct comparison of the effect of tariff and non-tariff barrier.

Linkins (2002) notes that the effect of non-tariff barrier is the difference between the market price of the restricted product and the market price for the good that has prevailed were it not for the restraint. This difference is generally expressed as a percentage of the free trade price, i.e., the tariff equivalent. Under certain conditions, the hypothetical price for the product would equal the prevailing world price. Of course, the conditions are rarely met.

Deardoff (1997) offers to measure non-tariff barrier as a price comparison of the domestic and foreign prices.
in the presence of non-tariff barrier:

\[ R = 100 \times \frac{P^*}{P}; \]

\[ P^* – \text{price of domestic product}; \]

\[ P – \text{price of imported product}; \]

or as a percentage difference between the prices, compared to a tariff:

\[ T = 100 \times \left[ \frac{P^* - P}{P} \right]; \]

Researches also note the dependence on the particular prices used for the comparison, these measures are commonly referred to as:

- tariff equivalents,
- implicit tariffs,
- implicit protective rates.

In most cases the information recourse for import and export prices is customs data systems, therefore the price comparison measures are imperfect:

- frequently the only available pricing data for imports and exports of products are unit values calculated on the basis of available value and quantity data,
- available data for imports, exports and domestically produced products are reported under different classification systems,
- the same classifications frequently include different types of products,
- the imported and domestic products are often imperfect substitutes because of differences in quality and conditions of sale,
- foreign country export prices are frequently not available.

Price comparison method has also at least one more imperfection: fully factored garments as well as cutting/making service is in the same category and reduces the average price in the countries producing garments compared to the countries only trading in textiles.

Concerning the main methods of measurement of non-tariff barriers, Baldwin (1989) comes to the conclusion that ignoring the fact of a number of difficulties theoretical and empiric analysis significantly improved and provided an opportunity to choose a corresponding trade policy to protect industries in separate countries. Equivalents to tariffs and subsidies compared to the price change before and after barrier introduction are considered as one of the best methods for measuring the presence or size of non-tariff barriers. These estimates were confirmed by Hoegh-Omdal and Wilhelmsen (2002) research. They chose an econometric clothing price model and calculated trade liberalization effect on Norwegian clothing market, i.e. analyzed the relation between price change and tariff reduction. According to the model, reduced tariff rates are reflected immediately in lower clothing prices. In the short term, one percentage point reduction in the tariff rate results in one percent lower rise in clothing prices.

The following empirical research might summarize the developments of the researches. The object of the research – the comparative analysis of consumer prices indexes including clothing and shoes in Norway, Sweden, representing the European Union, and USA covering gradual reduction of tariff rates in the international textile trade 1995-2005. Table 2 represents the reduction of World Trade Organization (WTO) quantitative restraints on textile and clothing products.

<table>
<thead>
<tr>
<th>Stage</th>
<th>Percentage of goods, GATT applied on</th>
</tr>
</thead>
<tbody>
<tr>
<td>1995 01 01 – 1997 12 31</td>
<td>16% (as minimum based on the year 1990 import level)</td>
</tr>
<tr>
<td>1998 01 01 – 2001 12 31</td>
<td>17%</td>
</tr>
<tr>
<td>2002 01 01 – 2004 12 31</td>
<td>18%</td>
</tr>
<tr>
<td>2005 01 01 full integration to the GATT and final quota elimination</td>
<td>49% (maximum)</td>
</tr>
</tbody>
</table>

The United States and EU chose a ten year period to liberalize trade while Norway eliminated last quotas from the main trade partners in 1998, i.e. six years earlier than the USA, EU and Canada. The experience of Norway could be considered as prospective reflection to European and American textile and clothing sector.

Figure 1 shows a rise of consumer price index in 1995-2004 from 94.2 to 113.3, i.e. almost 20 percentage points. It also indicates the decline in clothing and shoes price index from 103.8 to 74.5, i.e. nearly 30 percentage points.

The fall in clothing prices over the past 6-7 years cannot be explained by means of traditional explanatory factors, because:

- currency exchange rate remained relatively stable,
- unemployment has been low,
- rise in labor costs has been high,
- economy has been strong,
- international producers prices have risen.

Norway consumer price index. Clothing and shoes. 1995-2004

![Figure 1. Consumer prices index in Norway](http://statbank.ssb.no/statistikkbanken/default_fr.asp?PLanguage=1).

The economy of Sweden, representing the EU, and USA was growing in 1995-2002 but prices for clothing and shoes were growing too (Figure 2 and 3).
The empiric analysis indicates there has been no similar fall in clothing/shoes prices in Sweden, representing EU, or the US. Although the rise in clothing prices in these countries has also been relatively slow. The background to these price developments was a resolution from Uruguay Round of GATT committing members to a substantial reduction of trade barriers to import of textiles.

This conclusion is reinforced by table 3, indicating the developments in tariff ties by trading partners classified according to the type of agreement under which they are regulated.

### Table 3

| Average tariff rates on clothing from the main Norway trade partners (%) |
|-----------------------------|---|---|---|---|
| East European countries    | 20   | 2    | 0    | 0    |
| EFTA countries             | 0    | 0    | 0    | 0    |
| Preferential origin (developing) countries | 20 | 19 | 16 | 7 |
| USA                        | 20   | 19   | 16   | 14   |
| Total                      | 8    | 7    | 6    | 3    |


So gradual reduction of tariff rates on international textile trade in 1995-2004 is proportional to the price reduction.

**Conclusions:**

1. Non-tariff trade barriers are very diversified and complex, the same products could be differently applicable to the Harmonized System commodity categories and cause inaccuracy in statistic data evaluating the presence or size of non-tariff barriers.

2. Non-tariff barriers could be measured as equivalent to tariff barriers, estimating them in terms of value. Price-change measures are based on price difference. “With” and “without” trade barrier allows a direct comparison of an effect of tariff and non-tariff barrier.

3. Reduced tariff rates are reflected immediately in lower clothing prices. Empiric research indicates in the short term, one percentage point reduction in the tariff rate results in a proportional one percent lower rise in clothing prices.

4. However, this long-term relationship may change because of factors such as transport costs, the continued existence of trade barriers and domestic competition.

5. The research indicates that price comparison method, perhaps, is the best for measuring the presence or size of non-tariff barriers in international textile trade as it allows to compare tariff and non-tariff trade barriers effects and relies on direct primary data.

6. Measuring the presence or size of a particular trade barrier, first advise would be to analyze the availability of data resources directly related to the barrier and then to select a specific method.

7. This survey outlines that there is no the only perfect method to rely on measuring the non-tariff barriers. Referring to the purpose of measurement of non-tariff barriers, it is appropriate to use any specific method presented in the article.

**References**


Aida Zigmantavičienė, Vytautis Snieška

Netarfinių barjerų matavimo metodai tarptautinėje prekyboje
tekstilo

Santrauka

Liberalizuojant tarptautinę prekybą, mažėja tarifinio prekybos įtaka, tačiau pastebimai progresuoja netarfiniai barjerai ir pradedama domėtis jų poveikui tarptautinei prekybai, jos dinamikai.

Pastaruoju dešimtmečiu įtakos įtaromos tarptautinei prekybai ir aprangos prekyboje prasidėjo 1995m. sausio 1d. ir buvo siejamos su Pasaulinės prekybos organizacijos (toliau – PPO) Sutartimi dėl tekstilės ir aprangos, kurį numatė dešimtmečio pokyčių tarptautinėje prekyboje tekstile taip pat keitė pasaulio eksporto ir importo srautų kryptis bei apimtis.

Esminių pasikeitimų tarptautinėje prekyboje ir aprangos prekyboje prasidėjo 1995m. sausio 1d. ir buvo siejami su Pasaulinės prekybos organizacijos (toliau – PPO) Sutartimi dėl tekstilės ir aprangos, kurį numatė dešimtmečio pokyčių tarptautinėje prekyboje tekstile taip pat keitė pasaulio eksporto ir importo srautų kryptis bei apimtis.

Esminių pasikeitimų tarptautinėje prekyboje ir aprangos prekyboje prasidėjo 1995m. sausio 1d. ir buvo siejami su Pasaulinės prekybos organizacijos (toliau – PPO) Sutartimi dėl tekstilės ir aprangos, kurį numatė dešimtmečio pokyčių tarptautinėje prekyboje tekstile taip pat keitė pasaulio eksporto ir importo srautų kryptis bei apimtis.

Esminių pasikeitimų tarptautinėje prekyboje ir aprangos prekyboje prasidėjo 1995m. sausio 1d. ir buvo siejami su Pasaulinės prekybos organizacijos (toliau – PPO) Sutartimi dėl tekstilės ir aprangos, kurį numatė dešimtmečio pokyčių tarptautinėje prekyboje tekstile taip pat keitė pasaulio eksporto ir importo srautų kryptis bei apimtis.

Esminių pasikeitimų tarptautinėje prekyboje ir aprangos prekyboje prasidėjo 1995m. sausio 1d. ir buvo siejami su Pasaulinės prekybos organizacijos (toliau – PPO) Sutartimi dėl tekstilės ir aprangos, kurį numatė dešimtmečio pokyčių tarptautinėje prekyboje tekstile taip pat keitė pasaulio eksporto ir importo srautų kryptis bei apimtis.
į

į
tautin

ė

šali

į

panaikinus netarifinį barjerą, matavimu. Skirtingai negu kiti matavimo metodu, šis leidžia tiesiogiai palyginti tarifinių ir netarifinių barjerų poveikį.

Išnagrinėjus pagrindinius netarifinių barjerų matavimo metodus, apibendrinant užsienio autorių tyrimėjimų rezultatus, prieita išvada, jog, nepaisant daugybės sunkumų, teorinė ir empirinė analizė gerokai patobulino ir teikia galimybę prieš ir po barjero įvedimo, yra geriausias nesakytinių barjerų matavimo būdas.


Mokslinės literatūros, rinkos praktikos ir empirinė analizė reizumojuama straipsnio išvados teigiant, kad netarifiniai barjerai tarptautinėje prekyboje tekste yra labai įvairūs, kompleksiški, o pagal harmonizuotus kodus dažniausiai tarsi skirtinai sukslaskifuoti tie patys tekstilės produktai apsunkina tikslesnių duomenų barjerams vertinti atranką. Pažymima, kad netarifiniai barjerai gali būti prilyginti muitiniais, taip suteikiant pirmiesiems vertinę reikšmę. Kainų pokyčių lyginimai prieš ir po barjero įvedimo geriausiai atlieka nemuitinio barjero matavimo funkciją.

Apibendrinant teigimą, kad netarifiniai barjerų mažinimas yra tiesiogiai proporcingas aprangos kainų mažėjimui. Tyrimo rezultatai parodo, kad trumpuoju laikotarpiu tarių mažėjimui tuo pat šalygoja kainų mažėjimą: tai tarifo sumažinimą tuo pat atsakos proporcingas kainos sumažėjimas. Laipniškas tarių mažinimas yra tiesiogiai proporcingas tekstilės kainų mažėjimui ir ilgumo laikotarpiu.

Tyrimas taip pat remiasi išvada, jog kainų pokyčio matavimo metodas iš šiame straipsnyje nagrinėjamos netarifinių barjerų poveikio matavimo metodų yra bene tinkamiausias tarptautinės prekybos textiloje barjerams vertinti, nes leidžia tiesiogiai palyginti tarifinių ir netarifinių barjerų poveikį, o duomenys tokiam matavimui yra gana tiesioginiai, neišvestiniai. Tačiau, norint pamatuoti atskiro netarifinio barjero įtaką tarptautinei prekybai, matavimo metodą pasirinkti reikėtų išanalizuoti, kurie duomenys, susiję su netarifiniu barjeru, yra pasiekiami.

Apibendrinant mokslinkes analizės ir tyrimo rezultatus, teigima, jog nėra vienintelio metodo, kuriuo būtų galima absoliuciai paskirti mažėjančius barjerus tekstilės sektorius. Šiam tikslui gali būti naudojamas, priklausomai nuo matavimo tikslų, kiekvienas iš straipsnyje nagrinėtų matavimo būdų.

Raktažodžiai: Netarifinių barjerų matavimas, tarptautinė prekyba tekstilo.

Received in November, 2005; accepted in February, 2006.

The article has been reviewed.