Trademark Protection or Protectionism?[*]

Eugenia Baroncelli [†]
Ekaterina Krivonos [‡]
Marcelo Olarreaga [§]

Abstract

This paper explores the extent to which discrimination against foreign applicants in the trademark registration process can be used as a "behind-the-border" barrier to imports. *Prima-facie* evidence shows that in some developing countries the ratio of trademark registration to applications is much higher for national than for foreign applicants, which is consistent with the notion of discrimination against foreign firms. A simple model is developed that suggests that incentives to discriminate are stronger when foreign firms produce products that are close in quality to the product produced by domestic firms. This hypothesis is then tested and empirically confirmed in three of the four countries in our sample, suggesting that discretion and discrimination in the trademark registration process can sometimes be used as a protectionist tool.

[†]University of Bologna and The World Bank. e-mail: ebaroncelli@worldbank.org
[‡]University of Maryland and The World Bank. e-mail: ekrivonos@worldbank.org
[§]CEPR and The World Bank. e-mail: molarreaga@worldbank.org

Non Technical Summary

Dating from antiquity, craftsmen's marks have been employed to identify the name of the maker and prevent fraud. Trademarks serve the purpose of helping consumers to distinguish those quality features that are not observable at the moment of the purchase of the product, such as the freshness of edibles or the reliability of a hard disk. Allowing economic agents to register trademarks, governments aim at reducing consumers' search costs and, indirectly, at stimulating firms to increase or maintain the quality and variety of standards of their trademarked products.

A potential problem with trademark protection – as with any regulatory instrument– is that it may be subject to political capture. By allowing certain firms to register their trademarks and not others, or by applying different standards to the enforcement of trademark legislation, an important commercial advantage can be granted to some firms. This paper explores the extent to which trademark registration discriminates against foreign firms – by not granting (or delaying) their trademark registration – becoming an additional weapon in the protectionist arsenal. Indeed, as traditional trade barriers, such as tariffs and quotas, have been eliminated in the developing world, much of the attention in the policy debate has shifted to the so-called "behind-the-border" barriers to trade.

Prima facie evidence for four developing countries suggests that there could be some discrimination in the registration process against foreign firms in at least two of the four countries under examination (China, Hong Kong, India and South Africa). A simple model is then developed to show that discrimination is more likely to occur when products offered by foreign firms are of similar quality to the ones produced by domestic firms. This implication of the model is then tested for each of the four countries. Results are consistent with the alleged trademark protectionism in three of the four countries, the exception being China.

1 Introduction

Dating from antiquity, craftsmen's marks have been employed to identify the name of the maker and prevent fraud. One of the many forms of intellectual property rights, trademarks are defined in the current economic and law literature as words, symbols or other signifiers used to distinguish a good or service produced by one firm from the services or goods produced by another firm (Landes and Posner 1987). Therefore, a "trademark" is also "an element of a process of communication...which typically originated with the owner or seller of a product and which is received by a prospective buyer of that product" (Papandreou 1956). Tied to the dynamics of communication, a function of information is clearly performed by a trademark, along with one of influencing, through the provision of such information, the final choice of the prospective buyer toward the purchase of that specific product.

Allowing economic agents to register trademarks, governments aim then at reducing consumers' search costs and, indirectly, at stimulating firms to increase or maintain the quality and variety of standards of their trademarked products. Trademarks serve indeed the purpose of helping consumers to distinguish those quality features that are not observable at the moment of the purchase of the product, such as the freshness of edibles or the reliability of a hard disk. Faced with a choice between two identical products, the consumer would only have a 50 percent chance to pick the one that incorporates the desired unobservable features. On the supply side, it would not be profitable for firms to incur higher costs for (unobservable) quality improvements if these could not be signalled to the prospective buyers to justify a higher sale price. In a market with information asymmetries, without a collective enforcement of trademark rights, there would be no incentive for quality improvements, the level of average quality would drop, and, at the extreme, the market for high-quality products would disappear. If the buyer does not know the quality level of the product she is about to purchase, but only the distribution of quality in the whole market, she will only be willing to pay the price of the average-quality product. Expecting to be offered only the price of an average-quality product, the sellers of above-average quality products will soon drop off that market. If buyers are rational and anticipate this

move from the sellers of high-quality products, they may offer to pay an even lower price to the remaining producers, which induces further exit from the group of producers of above-average quality goods. This continues until high-quality goods are driven out of the market and only the lowest quality good remains (Akerlof, 1970). It follows that, by protecting trademark rights, public authorities secure the existence of markets for high-quality goods, through the reduction of information asymmetries between sellers and buyers. Trademark protection both helps reduce search costs for consumers and induces increase of quality standards for firms. Excluding companies with clear hit-and-run strategies, firms that have a long-term business horizon and care about establishing their reputation will draw crucial advantages from the public enforcement of trademark rights.[1]

A potential problem with trademark protection – as with any regulatory instrument– is that it may be subject to political capture. By allowing certain firms to register their trademarks and not others, or by applying different standards to the enforcement of trademark legislation, an important commercial advantage can be granted to some firms. This paper explores the extent to which trademark registration discriminates against foreign firms – by not granting (or delaying) their trademark registration – becoming an additional weapon in the protectionist arsenal.[2] By not granting (or delaying) trademark registration to foreign producers, the trademark office can effectively shift profits from foreign to home producers. The incentives to do so are explored in a situation with one domestic firm and a number of foreign firms operating in the home market. The results suggest that the government of the home country will have stronger incentives to discriminate against products similar in quality to the ones produced by the domestic firm. The idea is that by not granting registration to products of relatively similar quality the government is able to shift profits

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[1]While a thorough analysis of the reasons for and against trademark protection are clearly beyond the scope of this paper, it is worth signalling that the costs of drafting laws, maintaining a trademark register and a registry, along with the administrative and judicial apparatuses necessary to deal with securing and sanctioning trademark rights may not always be offset by the increase in both consumers' and producers' surpluses associated with trademark enforcement.

[2]Discrimination in the enforcement of trademarks can also potentially be used as a discriminating tool. Note that, by explicitly doing so, the discriminating government would violate its national treatment obligations in Article 2 of the Paris Convention (administered by WIPO) and therefore the WTO's TRIPS agreement. But agreements being incomplete contracts, there may be room for circumventing obligations.

to domestic firms without excessively hurting consumers.

The empirical part of this paper focuses on four developing countries, where a majority of trademarks are held by non-resident firms (the reverse is true in high-income countries; see Baroncelli, Fink and Javorcik 2003). The four countries are China, Hong Kong, India and South Africa. Section 2 offers some *prima-facie* evidence of discrimination against foreign applicants in the trademark registration process of each of the four countries. Section 3 puts forward an analytical model to explore incentives to discriminate against foreign applicants. Section 4 provides the empirical methodology, and section 6 shows the results. Section 6 concludes.

2   Trademark Protectionism: *Prima-facie* Evidence

To assess the degree of discrimination against foreign applications in the area of trademark registration, we constructed the following indicator of discrimination against foreign firms, $d_{c,i}$, located in country c and industry i trying to register a trademark in the domestic market:

$$d_{i,c} = \frac{r_i^H / a_i^H}{r_{i,c}^F / a_{i,c}^F} \tag{1}$$

where r_i^H is the number of trademarks registrations processed by the national trademarks office in the name of residents (home producers) in sector i; a^H is the number of trademarks applications filed directly with the national trademarks offices in the name of residents (home producers) in sector i; $r_{i,c}^F$ is the number of trademark registrations in sector i received by national trademarks offices in the name of non-residents from country c plus designations under either the Madrid Agreement or the Madrid Protocol ("which have not been the subject of a refusal of protection or which are no longer open to such refusal"); and $a_{i,c}^F$ is the number of applications filed in sector i directly with the national trademarks office in the name of non-residents from country c plus the number of trademarks designations under the Madrid Agreement or Protocol.[3]

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[3]The data on registrations are from Baroncelli, Fink and Javorcik (2003). The data on applications are from WIPO's CD-ROM on trademarks. The Madrid Agreement of 1891 and the Madrid Protocol of 1989

Our indicator is used as a proxy measure of the rate of transformation of domestic applications into valid registrations, compared to the same ratio when the applicant is a foreign individual or a foreign company (either a person that is not resident within the territorial jurisdiction of the reporting country – hereafter referred to as "destination" – or a company that has not been incorporated in the same territorial jurisdiction).[4] Values greater than one indicate that the rate of transformation is higher for domestic applicants and that discrimination against foreign applicants may be present. A high variation in this ratio across industries (even though values may be smaller than one) can also reflect discrimination in some sectors against foreign producers.

In China and Hong Kong, for example, the manufacturing average ratio d is around 0.8 and 0.7 respectively[5]. All manufacturing sectors had an average d below 1, suggesting that there is no evidence of discrimination against foreign firms trying to register their trademarks. On the other hand in India and South Africa, the manufacturing average ratio d is 1.3 and 1.5 respectively, suggesting that discrimination against foreign firms may be present, as on average domestic applications are more likely to finalize in registration.

There are 24 manufacturing sectors in South Africa that had a discrimination indicator d above 1, and 20 sectors in India out of potentially 34 manufacturing sectors in WIPO's NICE classification. The discrimination indicator reached values above 2 for 4 manufacturing sectors in South Africa and 6 in India. The four sectors in which South Africa seems *a priori* to discriminate the most against foreign firms in terms of trademark registration are: ropes and strings (with $d = 3.5$), varnishes sector ($d = 2.6$), agriculture products n.e.c. ($d = 2.2$), and furniture and mirrors ($d = 2.0$). Other sectors with a value of the discrimination index above 1 include musical instruments, common metals, hand tools and implements, vehicles, building material, textile, clothing and footwear, meat fish and poultry, coffee, tea and cocoa, beers and soft drinks, alcoholic beverages, and tobacco. The

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substantially reduce the transaction costs involved in registering trademarks by allowing firms that reside in member states to file a single international application for registration in multiple countries. For more on data sources and construction of variables, see the Appendix B.

[4]One can imagine that foreign firms that are domestically established may also be subject to discrimination. This unfortunately cannot be analyzed with the data that is available to us.

[5]Note that in Hong Kong all services industries have a ratio d above 1, probably signalling discrimination in sectors where the Hong Kong economy is specialized.

six sectors where the discrimination index takes values above 2 in India are: firearms and ammunitions ($d = 4.9$), meat and fish products ($d = 3.3$), lace and embroidery ($d = 2.9$), leather ($d = 2.4$), hand tools and implements ($d = 2.3$), carpets and mats ($d = 2.0$). Other sectors with a value for the discrimination index above 1 in India include: household and kitchen utensils, paints and varnishes, games and playthings, agricultural and horticultural products n.e.c., coffee and tea, precious metals, common metals, textiles, bleaching preparations, and apparatus for lighting.

There is also a significant variation in terms of discrimination across foreign source countries applying for trademark registration in all four destination countries (see Figures 1 to 4). In China, Argentina, Greece and Israel face a discrimination index above 1.5, indicating that the ratio of registration to applications is approximately 50 percent higher for domestic applicants than for applicants from any of these countries. In Hong Kong, applicants from Portugal and Russian Federation face an average discrimination ratio above 1.5. In India, Austria, Belgium, Canada, China, Finland and the Russian Federation are the countries with discrimination ratio above 1.5. Finally, in South Africa applicants from Argentina, China, Finland, Hungary, India, Korea, Luxembourg, Netherlands, Portugal face a discrimination index above 1.5.

Thus, there seems to be *prima-facie* evidence that there is some degree of discrimination in the registration process against foreign applicants in the four countries under examination. However, two points need to be raised. First, a value of the average discrimination index below 1 does not mean there is no discrimination to be detected at all. For example, if foreign firms were to have a better (less costly) application technology, discrimination against foreign firms would be consisttent with a value of d below 1. The cross-industry and cross-country variation in the registration discrimination index, d, could provide important information that could help us identify the presence or absence of discrimination against foreign trademark applicants regardless of the average discrimination index. This is the approach followed in the next section, where we provide an analytical framework which allows us to identify incentives to discriminate against different country/sectors. Moreover, the absence of discrimination in the registration process tell us very little about overall discrim-

ination in trademark regulation. The crucial source of discrimination could be present in the enforcement of the trademark registration rather than on the registration of trademarks themselves. For instance, the fact that China seems to exhibit little discrimination in the registration process is perfectly consistent with strong discrimination on the enforcement of trademark regulations. Unfortunately, we have no data on enforcement and therefore a complete exercise is not possible.

Second, one may wonder how countries can discriminate against foreign applicants if different conventions and international agreements prevent them from doing so[6]. A possible answer is the excess discretion granted to trademark offices or the lack of clear rules for the adjudication of trademarks. For example, the Chinese Trademark Law of 1983 (amended in 1993) and the Implementing regulations set very few deadlines for either the Trademark Office or the Trade Review and Adjudication Board to give feedback to private entities. For example, after being notified of a refusal by the Trademark Office on grounds of non conformity, such as identity or similarity with another (national) registered or preliminary approved trademark, the (foreign) applicant has 15 days to apply to the Trademark Review and Adjudication Board for a review. No deadlines are set either in the law (Art. 21) or in the Implementation regulations (Rules 16 and 17) concerning when the Trademark Office or the Board need to notify the application.

India had no provisions for well-known marks until the new Trademark Act was passed in 1999. This implies that well-known foreign marks had no guarantee of having their rights enforced under the Trade and Merchandise Act of 1958.[7] Note that the data presented above and used in the empirical section are for the period 1994-1998 (see the Appendix B) and therefore correspond to regulations under the old trademark law. Another problem of

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[6]Note that there is currently a trade dispute in the WTO regarding (potential) discrimination against foreign applicants of trademarks (and geographical indications) regulations for agricultural products and foodstuff in the European Union. The case was brought up by the United States and Australia and other countries have requested to be third parties.

[7]Discretion in the interepretation of the law also explains why two restaurants in South Africa were allowed to use the name "McDonald's" after McDonald's corporation missed a deadline to renew its registration in the early 1990s. It took multiple lawsuits and a reversal by the Supreme Court of South Africa of an earlier decision by a lower court to McDonald's to get the rights to its world famous name (case no. 547/95).

the old law that has now been remedied is the absence of an Appellate Board. However, the extent of discretion granted to the Trademark Registrar continues to be important in some areas. For example, in the area of application examination, Section 4 of Article 18 of the Indian 1999 Trademark Act states that the Registrar is entitled to refuse an application or to subject its validity to compliance of amendments, modifications, conditions or limitation "if any, as he may think fit". The new law also contains some regulations that discriminate against foreigners when it comes to opposition to an advertised application. Article 21 grants discretion to the Registrar to ask for a security deposit to be provided in case the opponent to the application is a foreign individual or a foreign firm that neither resides nor carries its business within the territory of India. The law does not provide for any specific sum or a range of payment, so the discretion retained by the Registrar seems unlimited, as is the scope of deterrence against a foreigner willing to secure her trademark rights in India.

3 Trademark Protectionism: An Analytical Setup

In the following we present a theoretical model that can explain the occurrence of discrimination in trademark registration against certain producers. A single firm in the home country produces a good that is only consumed domestically. The domestic firm competes with n foreign producers, each of which sells on the domestic market. The goods is vertically differentiated, that is, its quality level q_i may vary. Producers face the same per unit cost function $C(q) = q^2$. There is a unique level of quality q_i corresponding to each country i and we take the quality levels chosen by each producer as given. The price received for the good by each producer equals $p(q) = C(q) + \pi$, where π is a fixed profit per unit of good sold. The government of the home country knows the variety of qualities available in the domestic market and can rank them, $q_1... \leq q_d \leq ... \leq q_n$, where q_d is the quality of the domestically produced good. Since the price of good only depends on the quality level chosen and not on the amount sold, the profits of the domestic producer are simply simply π multiplied by quantity of q_d sold on the domestic market.

Quality is not observable *ex-ante* by consumers which differ in their taste for quality, or marginal willingness to pay, denoted by a continuous and uniformly distributed variable $\theta \in [\theta_{low}, \theta_{high}]$. We normalize the range of θ to be between 0 and 1. Each consumer buys 1 unit of the good of quality q_i, if the net utility of doing so is greater than or equal to zero:

$$U(\theta, q_i) = \theta q_i - p(q_i) \geq 0 \tag{2}$$

In the absence of registered trademarks consumers cannot observe the actual quality level of the good. If the only registered trademark is the domestic one, all foreign brands disappear from the market, except the generic one with quality level q_{low}, because consumers can not distinguish between the high quality good and the generic one. The authorization to register only the domestic good effectively cuts the market into two segments: consumers that value high quality will buy the domestic brand and all others will buy the generic (no trademark) foreign product. This can be seen by focusing on a simplified consumer problem with one registered trademark (domestic). Consumer's problem becomes:

$$\text{Max}\{\theta q_d - p(q_d), \theta q_{low} - p(q_{low})\} \tag{3}$$

Consumers will prefer to buy the domestic brand if and only if:

$$\theta \geq \frac{p(q_d) - p(q_{low})}{q_d - q_{low}} \tag{4}$$

Denote the critical level of willingness to pay for the domestic quality $\theta^* = \frac{p(q_d) - p(q_{low})}{q_d - q_{low}}$. In the absence of registered foreign trademarks the market share of the domestic firm is $\theta_{high} - \theta^*$ with the remaining consumers $\theta^* - \theta_{low}$ buying the generic foreign good.

Allowing foreign firms to register their trademarks reduces the informational asymmetry between the producers and the consumers, giving the latter more options to choose from. The market becomes segmented corresponding to the number of brands registered on the domestic market. Consumers maximize their net utility given the observed quality levels available and their marginal willingness to pay. Consumers with higher θ choose better-

quality goods. Figure 5 illustrates the consumer's optimal choice depending on her θ. Each curve represents the net level of utility associated with a certain quality level $q_{low} < q_1 < q_d < q_{high}$. If foreign firms producing goods of quality q_1 and q_{high} are not allowed to register their trademarks, so that only the domestic brand and the generic brands are available, any consumer with $\theta \geq \theta^*$ will purchase the domestic brand, as suggested by (4), and the rest will buy q_{low}.

If, on the other hand, foreign firms are allowed to register their trademark products of quality levels q_1 and q_{high}, only consumers with $\theta_1 \leq \theta \leq \theta_2$ will consume the domestic brand, significantly reducing the market share of the domestic firm and causing losses to its total profits. Thus, by preventing foreign trademark registration, the government can increase the domestic firm's market share, at the cost of lower utility for consumers, corresponding to the shaded area in Figure 5.

We assume that the government has perfect information about the quality levels of the goods originating in each country and controls trademark registration. It maximizes the social welfare, which is the sum of producer and consumer welfare:

$$W = \pi \Delta \theta + \int_{\Delta \theta} U(\theta, q_d) d\theta + \sum_{i=0}^{n} \int_{\theta_i} U(\theta, q_i) d\theta \qquad (5)$$

where π and $\Delta \theta$ are the per unit profit and the market share of the domestic firm, respectively, q_i is the quality of the good produced in country i and θ_i is the market share of that country. Thus, the first term on the right-hand side is the domestic profits and the two last terms are consumer surplus of consumers buying the domestic and the foreign goods, respectively. The government maximizes W by choosing which brands are permitted to register their trademarks. Note that, by changing the variety of the registered foreign goods available to the domestic consumers through trademark protection, the government affects the market segmentation. The market shares of home and foreign firms are affected by the government's decision to accept or to decline trademark applications.

Discriminating against foreign firms can be optimal from a welfare perspective in the same sense that tariffs can be optimal in a world with imperfect competition, as they shift

profits away from foreign firms to domestic firms. Thus, the profit-shifting argument is present in this setup and can justify the use of discrimination towards foreign firms, which leads to an increase in domestic firms' market share and profits. However, as it can be seen in Figure 5, consumers lose from discrimination, since there are fewer choices available. Discrimination against country 1 leads to disappearance of q_1 from the market, forcing the consumers that earlier chose that good to pick either q_d or q_{low}. Consumers located to the right of θ^* choose the domestic product and the ones located to the left of θ^* pick the generic good. This shift induces welfare losses for that particular group equal to the shaded area.

Consider the situation when the domestic good is the one of lowest quality relative to the imported goods, as depicted in Figure 6. This a realistic assumption in the case of developing countries, where domestically produced goods in some sectors could be considered inferior to foreign goods. First note that if all trademarks are registered initially, there is no point in removing trademark registration for a foreign brand that is of a very different quality than the one produced domestically. In terms of Figure 6, removing trademark registration for q_{high} or q_2 when q_1 is present has no impact on the market share of the domestic firm, which continues to sell to consumers with $\theta \leq \theta_1$. On the other hand, disappearance of, for instance, q_2 reduces consumer welfare, since those who previously bought this good are now forced to chose between q_1 and q_{high}. It follows that the country unambiguously loses from discriminating against country 2.

Starting from a situation when all countries are allowed to register their trademarks on the domestic market, it is welfare-improving to discriminate against q_1 if and only if the extra profits created exceed the welfare losses to consumers. The change in consumer surplus when q_1 disappears from the market equals

$$\Delta CS_1 = -\left[\int_{\theta_1}^{\theta_3} U(\theta, q_1)d\theta - \left(\int_{\theta_1}^{\theta_2} U(\theta, q_d)d\theta + \int_{\theta_2}^{\theta_3} U(\theta, q_2)d\theta \right) \right] \tag{6}$$

Discrimination against q_1 involves welfare losses to consumers, but the domestic firm's profits increase as more people buy the local good. The market share of the domestic firm

increases by $\theta_2 - \theta_1$ as the result of discrimination. The total welfare change is $\Delta W_1 = \pi(\theta_2 - \theta_1) + \Delta CS_1$. Discrimination will occur if the expression is positive.

When q_1 is prohibited from trademark registration, the next step for the government is to decide whether to carry out further discrimination and deny trademark registration to country 2. Disappearance of q_2 gives the domestic firm yet greater share of the market. The welfare change in this situation is $\Delta W_2 = \pi(\theta_4 - \theta_2) + \Delta CS_2$, where ΔCS_2 is calculated in a manner similar to ΔCS_1 in (6). We analyze the relationship between ΔW_1 and ΔW_2 in the special case of quality levels that are distributed evenly in the quality space: $q_1 - q_d = q_2 - q_1 = q_{high} - q_2 = \Delta q$. In Appendix A we show that if initially it is welfare improving to discriminate, the incentive to do so subdue when the next-best foreign brand is considered, that is $\Delta W_1 \geq \Delta W_2$. The reasoning can be extended to other quality levels, such that the positive welfare change which induces discrimination initially falls the further we move away from the quality level of the domestically produced good. Assuming it were welfare improving to discriminate against q_1, at some point the losses to consumers caused by subsequent discrimination outweigh the extra profits accruing to the domestic firm. Thus, a country discriminates against countries that export goods similar in quality to the one produced by domestic firm and allows trademark registration of brands very different from the domestic one. In other words, if trademark registration is used as a protectionist tool, then discrimination is more likely in the case of foreign firms that produce goods similar in quality to the domestic ones. This will be the basic assumption explored in the empirical section of the paper.

4   Trademark Protectionism: Empirical Methodology

To test for the presence of protectionist rationale behind discrimination in trademark registration we explore the correlation between the registration discrimination index developed in section 2 and a proxy for quality differences between domestic and foreign firms. More specifically, for each of the four countries under examination (China, Hong Kong, India

and South Africa) we run the following regression:

$$d_{i,c} = \beta_1 \Delta q_{i,c} + \beta_2 m_c + \beta_3 \alpha_i + \epsilon_{i,c} \qquad (7)$$

where $d_{i,c}$ is the trademark registration discrimination index in industry i for products originating in country c, $\Delta q_{i,c}$ is the absolute value of the difference in quality in products of industry i produced in country c versus products of the same industry produced in the home country (China, Hong Kong, India or South Africa); α_i is an industry dummy included to capture any industry specific effect (e.g., higher trade protection in a particular industry or better organized lobbies); m_c is the share of imports from country c in total imports of the destination country, and $\epsilon_{i,c}$ is an i.i.d error term. A negative β_1 indicates that as the difference in quality between domestic and foreign products increases, there is less discrimination against foreign firms. This will be consistent with the notion of trademark protectionism explored in the previous section. Import share m_c is included to test whether discrimination is more likely to occur in cases where the exporting country already has a large share of the domestic consumption of foreign goods. This could happen, if we assume that a large import share means that the goods imported from that particular country are similar in quality to the domestic goods (based on the Linder hypothesis). A positive β_2 would then strengthen the argument that discrimination is stronger in the cases of close resemblance between foreign and domestic products.

The quality level of products in a particular industry i is captured by the share of sector i's exports to the QUAD (Canada, European Union, Japan and the United States) in total industry exports. The difference in quality between products produced in the home country and its trading partners is therefore calculated as $\Delta q_{i,c} = |s_{i,H} - s_{i,c}|$, where $s_{i,c}$ is the share of industry i's exports to the QUAD in country c's total exports of i. In the case of QUAD members' exporters, we also include their sales at home in the calculation of $s_{i,c}$. Subscript H stands for the home country (i.e., destination country): China, Hong Kong, India and South Africa. We propose taking the difference rather than the ratio when measuring $\Delta q_{i,c}$ in order to avoid losing observations when exports to the QUAD of country c are equal to zero. Note however that estimates using the ratio are qualitatively identical to the ones

reported in Tables 1 and 2.

The basic assumption for using this ratio as an indicator of product similarity is that products consumed in the QUAD are of relatively high quality, as QUAD consumers (i.e., consumers in rich countries) have higher θs than consumers in the rest of the world. This hypothesis was first put forward by Linder (1961). Fink, Javorcik and Spatareanu (2003) and Hallak (2003) have recently provided some empirical evidence in favor of this assumption using very different approaches. Thus, if a pair of countries are exporting a similar share of their exports to rich countries, then it is likely that the products they produce are of similar quality.

Alternatively, the differences in quality levels could be captured by prices (or per unit import values) of the domestic and the imported goods. An important *caveat* is that we would need to compare very specific products. Our trademark protection data, however, are aggregated at the industry levels – we can not calculate discrimination index for each particular good. For example, for each exporting country we have discrimination index for textiles and apparel sector, but comparing the quality of a "representative" good in this sector does not seem feasible, since we can only obtain per unit prices of specific goods, such as men's shirts or T-shirts.

5   Empirical Results

Table 1 shows the results of the estimation of equation (7) using a pool of the four destination countries, with and without industry dummies (α_i), with and without home destination country dummies and with and without aggregate import shares from each source country. All six regressions reported in Table 1 show a negative and significant relation between differences in product quality and discrimination against foreign firms in the trademark registration process. The three last regressions also show that aggregate import shares enter positively into the equation explaining discrimination. This implies that the larger are imports from a particular country, the more likely is that country to be discriminated against, which would also support our theoretical prediction if one assumes that the Linder

hypothesis holds (i.e., countries that produce and consume similar products trade significantly with each other).

Table 2 provides estimates of equation (7) by country for each of our 4 destination countries (China, Hong Kong, India and South Africa), but excluding the aggregate import share variable m_c. Three of the four countries in the sample show again a negative and significant correlation between quality differences and discrimination against foreign firms. The exception is China, where there was initially very little *prima facie* evidence of discrimination against foreign firms. Note that in Hong Kong, whereas *prima facie* evidence was also weak, the econometric evidence suggests that the trademark registration process can be used as a protectionist device.

Table 3 adds the aggregate import share variable, m_c to the results provided in Table 2. Again our indicator of quality difference, $\Delta q_{i,c}$ is negative and statistically significant in India, South Africa and Hong Kong (although in Hong Kong only at the 10 percent level). Again in China, there seems to be no evidence of discrimination at this level. The variable, m_c which captures incentives for discrimination at the aggregate country level is insignificant in both India and South Africa, signalling that most of the discrimination is explained by quality differences at the industry/country level. However, in China and Hong Kong, m_c is positive and statistically significant signalling discrimination at the country level. Countries from where China and Hong Kong seem to import significant amounts (and therefore may share similar taste and produce similar products) face more discrimination in the trademark registration process.

6   Concluding Remarks

As traditional trade barriers, such as tariffs and quotas, have been eliminated in the developing world, much of the attention in the policy debate has shifted to the so-called "behind-the-border" barriers to trade. Although it is difficult to give a comprehensive definition of this concept, it includes any policy or institutional setup that explicitly or implicitly discriminates against foreign firms. The barrier explored in this paper is the

potential capacity of trademark offices to discriminate against foreign firms in the registration of their trademarks. By not allowing foreign firms to register their trademarks, these institutions can reduce the capacity of the foreign firms to penetrate the home market.

Prima facie evidence for four developing countries suggests that there could be some discrimination in the registration process against foreign firms in some of these countries. A simple model is then developed to show that discrimination is more likely to occur when products offered by foreign firms are of similar quality to the ones produced by domestic firms. This implication of the model is then tested for the four countries under examination (China, Hong Kong, India and South Africa). Results are consistent with the alleged trademark protectionism in three of the four countries, the exception being China. It should be kept in mind, however, that the absence of protectionism in the registration process is consistent with the presence of protectionism in the enforcement of trademark law. One potential direction for future research is to explore the extent to which enforcement of trademark legislation can also be used as a protectionist tool, in particular in countries where there is little evidence of discrimination in the registration process.

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Appendix A - The Theory

According to (6) the change in consumer surplus as the result of q_1's disappearance from the market equals

$$\Delta CS_1 = -\left[\int_{\theta_1}^{\theta_3} U(\theta, q_1)d\theta - \left(\int_{\theta_1}^{\theta_2} U(\theta, q_d)d\theta + \int_{\theta_2}^{\theta_3} U(\theta, q_2)d\theta\right)\right]$$

Applying the definition of net utility in (2), integrating and rewriting the breaking points θ_1, θ_2 and θ_3 in terms of quality levels and prices consistent with (4) yields

$$\Delta CS_1 = -\frac{[(q_2 - q_1)p(q_d) + (q_1 - q_d)p(q_2) - (q_2 - q_d)p(q_1)]^2}{2(q_2 - q_1)(q_1 - q_d)(q_2 - q_d)} \tag{8}$$

The expression is negative since $q_2 > q_1 > q_d$ and $p(q)$ is strictly convex[8]. Thus, consumers unambiguously lose from discrimination against country 1. The change in the domestic firm's profits is

$$\Delta \Pi_1 = \pi(\theta_2 - \theta_1) = \pi\left(\frac{p(q_2) - p(qd)}{q_2 - q_d} - \frac{p(q_1) - p(qd)}{q_d - q_d}\right) \tag{9}$$

Assume

$$q_1 - q_d = q_2 - q_1 = q_{high} - q_2 = \Delta q > 0 \tag{10}$$

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[8]Strict convexity of $p(q) = q^2 + \pi$ insures that $\frac{(q_2-q_1)p(q_d)}{(q_2-q_d)} + \frac{(q_1-q_d)}{(q_2-q_d)}p(q_2) > p(q_1)$

, so that all quality distances are equal. Then (8) and (9) become

$$\Delta CS_1 = -\frac{[p(q_d) + p(q_2) - 2p(q_1)]^2}{2\Delta q} \tag{11}$$

and

$$\Delta \Pi_1 = \frac{\pi [p(q_d) + p(q_2) - 2p(q_1)]}{2\Delta q} \tag{12}$$

$\Delta \Pi_1$ is strictly positive since is follows from the strict convexity of $p(q_d)$ that $p(q_1) < \frac{1}{2}p(q_d) + \frac{1}{2}p(q_2)$.The change in social welfare as the result of discrimination against country 1 is then

$$\Delta W_1 = \Delta \Pi_1 + \Delta CS_1 = \frac{\pi (p(q_d) + p(q_2) - 2p(q_1)) - [p(q_d) + p(q_2) - 2p(q_1)]^2}{2\Delta q} \tag{13}$$

The government decides to discriminate against country 1 if $\Delta W_1 > 0$, which requires $\pi > p(q_d) + p(q_2) - 2p(q_1)$. Assuming that π is high enough to induce discrimination, the government discriminates and q_1 disappears from the market. The next step for the government is to decide whether discriminative action against country 2 should take place. In this case the domestic firm gains additional market share $\theta_4 - \theta_2$. Following the approach described above, the change in the total welfare from discriminating against q_2 can be calculated as

$$\Delta W_2 = \Delta \Pi_2 + \Delta CS_2 = \frac{\pi (p(q_d) + 2p(q_h) - 3p(q_2)) - [p(q_d) + 2p(q_h) - 3p(q_2)]^2}{6\Delta q} \tag{14}$$

To compare the welfare changes brought by the two cases of discrimination adopt the following notation:

$$a = p(q_d) + p(q_2) - 2p(q_1) \tag{15}$$

and

$$b = p(q_d) + 2p(q_h) - 3p(q_2) \tag{16}$$

Then

$$\Delta W_1 - \Delta W_2 = \frac{\pi a - a^2}{2\Delta q} - \frac{\pi b - b^2}{6\Delta q} \tag{17}$$

Using $p(q) = q^2 + \pi$ in (15) and substituting in $q_1 = q_d + \Delta q$ and $q_2 = q_d + 2\Delta q$, which follows from (10), we obtain

$$a = q_d^2 + \pi + q_2^2 + \pi - 2(q_1^2 + \pi) = q_d^2 + (q_d + 2\Delta q)^2 - 2(q_d + \Delta q)^2 = 2\Delta q^2 \tag{18}$$

Similarly, expression (16) simplifies to

$$b = q_d^2 + \pi + 2(q_h^2 + \pi) - 3(q_2^2 + \pi) = q_d^2 + 2(q_d + 3\Delta q)^2 - 3(q_d + 2\Delta q)^2 = 6\Delta q^2 \tag{19}$$

Note that, in the special case of quadratic cost function $C(q)$, a is exactly three times smaller than b, regardless of the levels of π and Δq. Since $a < b$, it follows that at $\pi = a$ discrimination against country 1 leaves the home country's welfare unchanged ($\Delta W_1 = 0$), but further discrimination leaves the country strictly worse of ($\Delta W_2 < 0$).

Substituting (18) and (19) into (17) and simplifying yields

$$\Delta W_1 - \Delta W_2 = 4\Delta q^2 \tag{20}$$

Since we assumed $\Delta q > 0$, the expression is strictly positive, implying that the change in welfare becomes smaller as the government moves from discriminating against country 1 to discriminating against country 2 as well.

Following the same approach it can be shown that further discrimination (against a hypothetical country 3) will produce a still smaller welfare change. It follows that if initially

it is welfare-improving to discriminate, the incentives to do so diminish with the number of brands, for which discrimination action is taken. The change in welfare continues to drop the more brands disappear from the market, eventually becoming negative. This is illustrated in Figure 7, where welfare changes are drawn as a function of π for a special case of $q_d = 1$, $q_1 = 4$, $q_2 = 7$ and $q_{high} = 10$. At $\pi = 30$, for example, it is welfare improving to discriminate against country 1, but the subsequent step to discriminate against country 2 would bring about losses. Already at this point the loss in consumer welfare outweighs the profit gain to domestic producers. The government stops to discriminate and allows the higher quality goods to compete with the domestic brand.

Note that the same type of analysis can be done for the case when the domestic good is the highest in quality, $q_d > q_1 > q_2 > q_{high}$. In this case the government also first chooses whether to discriminate against the country which is closest in quality to the domestic brand and then whether to discriminate against the next country. The implications are the same as before: it may be welfare-improving to discriminate against the closest competitor (country 1), but further discrimination will produce smaller welfare gains, which eventually turn into losses.

Appendix B - The Data

The data set used for this study includes trademarks, trade, production and tariff data for four countries (China, Hong Kong, India and South Africa), each of which is considered as the country of registration of brand names, and will hereafter be referred to as "destination"). The data are at the industry level, covering the period from 1994 to 1998. An average for this period is taken for every observation. The reason for this is that the trademark registration process can often take more than one year and we therefore wanted to avoid any biases due to the long delays that registration may often entail. In some of the countries in our sample, the registration process can take easily two to three years. Data on trademarks registrations and applications are disaggregated by country requesting a registration (hereafter referred to as "source").

The sources of the trademarks data are the CD-ROM version of the 1998 WIPO database on trademarks, and the 2002 World Bank Trademarks Database (Baroncelli, Fink and Smarzynska 2003), also based on WIPO data. The sector disaggregation used here is a combination of the Nice Classification, the system used in both the WIPO and World Bank sources, and the International Standard Industrial Classification (ISIC) at the three-digit level, in which most of the output and trade data are reported. The final industry classification has 22 sectors. The country source disaggregation is the one provided by WIPO and discussed in Baroncelli, Fink and Smarzynska (2003). There are potentially 40 source countries in WIPO's database. The trade and production data necessary to construct the export shares in the calculation of $\Delta q_{i,c}$ come from the World Bank Trade and Production Database (Nicita and Olarreaga 2001). The data have been integrated with updated data from the United Nations Statistics Comtrade database as well as with the United Nations Industrial Development Organization (UNIDO).

Table 1: *Trademark Protectionism: Pooled results*[a]

	(1)	(2)	(3)	(4)	(5)	(6)
Difference in quality	-0.13**	-0.17**	-0.14**	-0.12**	-0.16**	-0.13**
$(\Delta q_{i,c})$	(0.02)	(0.03)	(0.03)	(0.02)	(0.03)	(0.03)
Import share				7.96**	7.94**	7.68**
(m_c)				(1.05)	(1.08)	(1.07)
Constant	-0.09**	No		-0.10**		
	(0.01)			(0.01)		
Industry dummy	No	Yes	Yes	No	Yes	Yes
Destination country dummy	No	No	Yes	No	No	Yes
R²-adjusted	0.01	0.09	0.12	0.01	0.09	0.13
# observations	1584	1584	1584	1584	1584	1584

[a] The endogenous variable is given by the registration discrimination index against foreign firms, $d_{i,c}$. All regressions are estimated using ordinary least squares. Figures in parenthesis are White-robust standard errors. ** stands for significance at the 1 percent level; and * for significance at the 5 percent level.

Table 2: *Trademark Protectionism by Country*[a]

	China	Hong Kong	India	South Africa
Difference in quality	0.04	-0.12**	-0.20**	-0.44**
($\Delta q_{i,c}$)	(0.07)	(0.04)	(0.05)	(0.07)
Source country dummy	Yes	Yes	Yes	Yes
R^2-adjusted	0.20	0.29	0.16	0.08
# observations	527	512	263	282

[a]The endogenous variable is given by the registration discrimination index against foreign firms in each of the four countries, $d_{i,c}$. All regressions are estimated using ordinary least squares. Figures in parenthesis are White-robust standard errors. ** stands for significance at the 1 percent level; and * for significance at the 5 percent level.

Table 3: *Trademark Protectionism by Country*[a]

	China	Hong Kong	India	South Africa
Difference in quality	0.02	-0.08[?]	-0.21**	-0.44**
$(\Delta q_{i,c})$	(0.08)	(0.05)	(0.05)	(0.07)
Import share	17.14**	5.28**	2.22	1.99
(m_c)	(2.25)	(1.68)	(2.53)	(4.62)
Source country dummy	Yes	Yes	Yes	Yes
R^2-adjusted	0.21	0.29	0.16	0.08
# observations	527	512	263	282

[a]The endogenous variable is given by the registration discrimination index against foreign firms in each of the four countries, $d_{i,c}$. All regressions are estimated using ordinary least squares. Figures in parenthesis are White-robust standard errors. ** stands for significance at the 1 percent level; * for significance at the 5 percent level, and ? for significance at the 10 percent level.
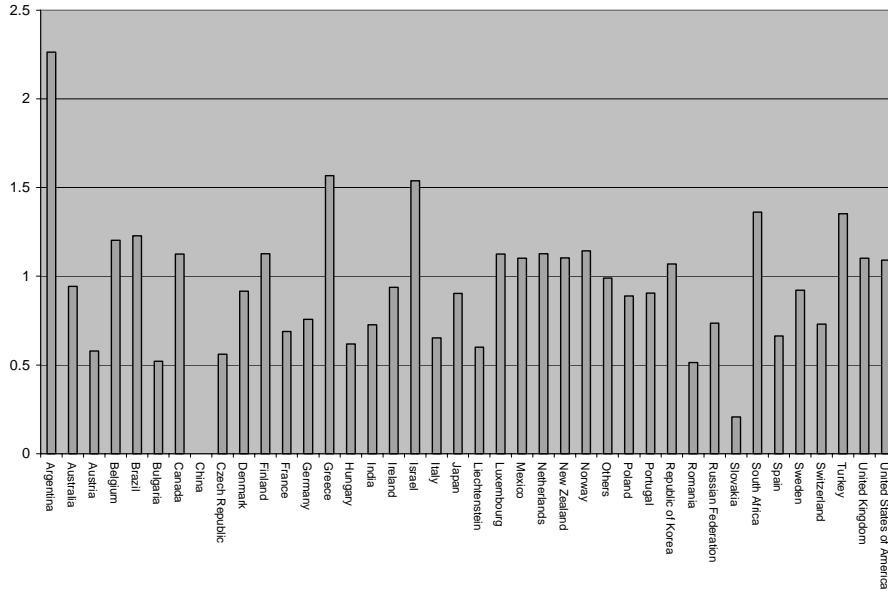
Figure 1: China's Index of Trademark Protectionism by Source Country
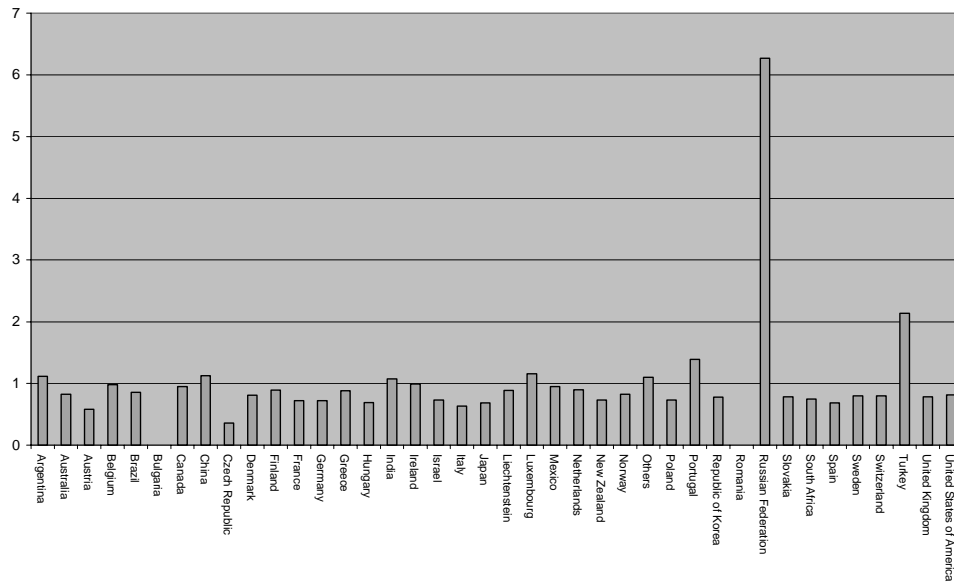
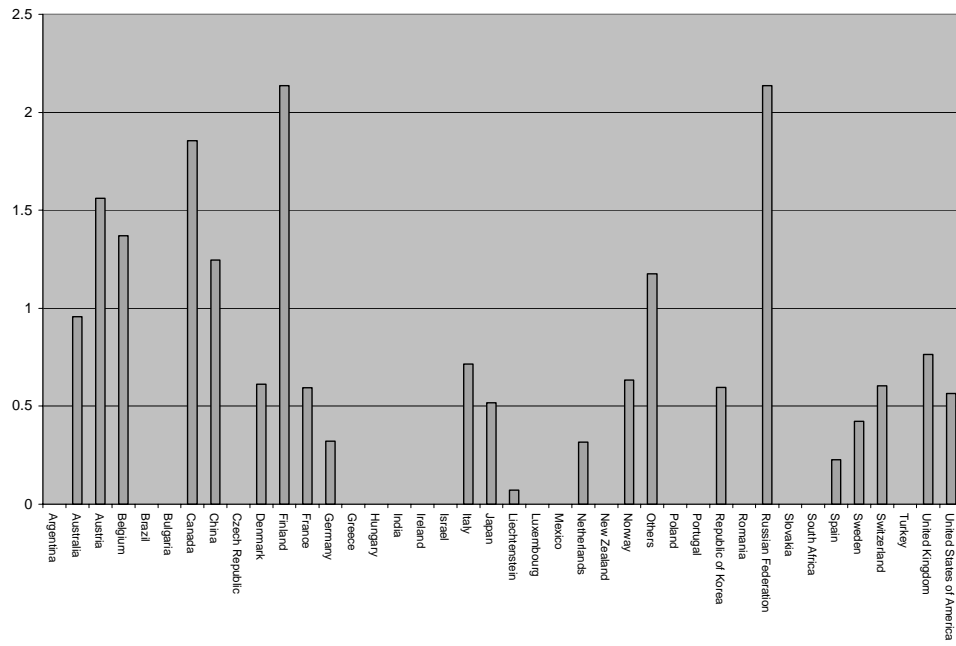Figure 2: Hong Kong's Index of Trademark Protectionism by Source Country

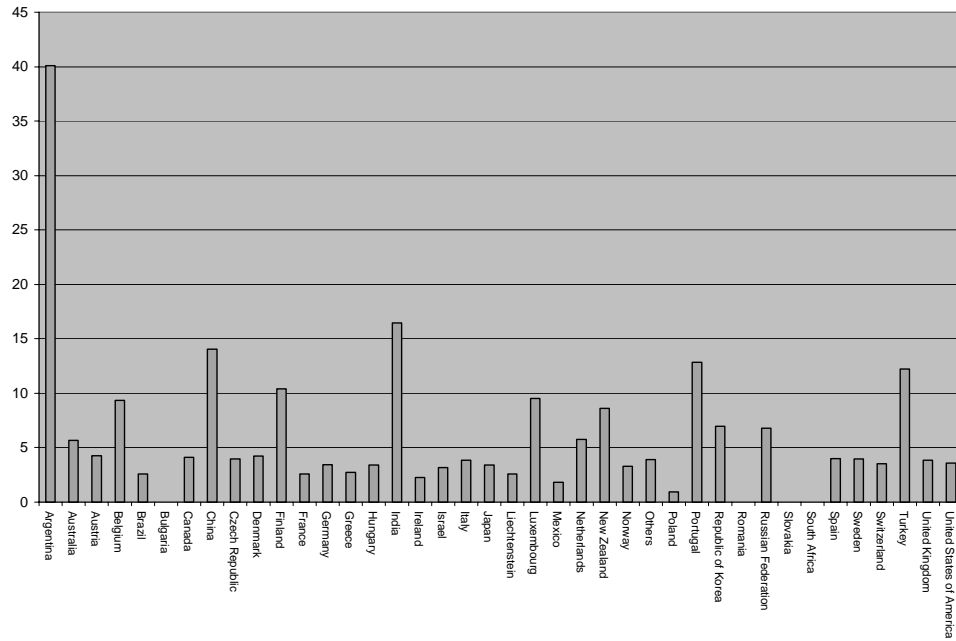Figure 3: India's Index of Trademark Protectionism by Source Country

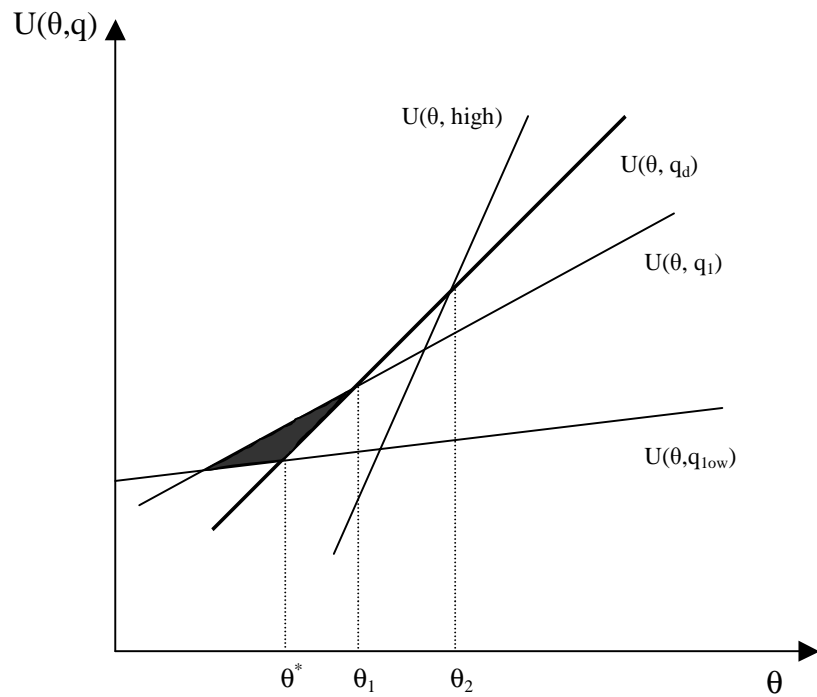Figure 4: South Africa's Index of Trademark Protectionism by Source Country
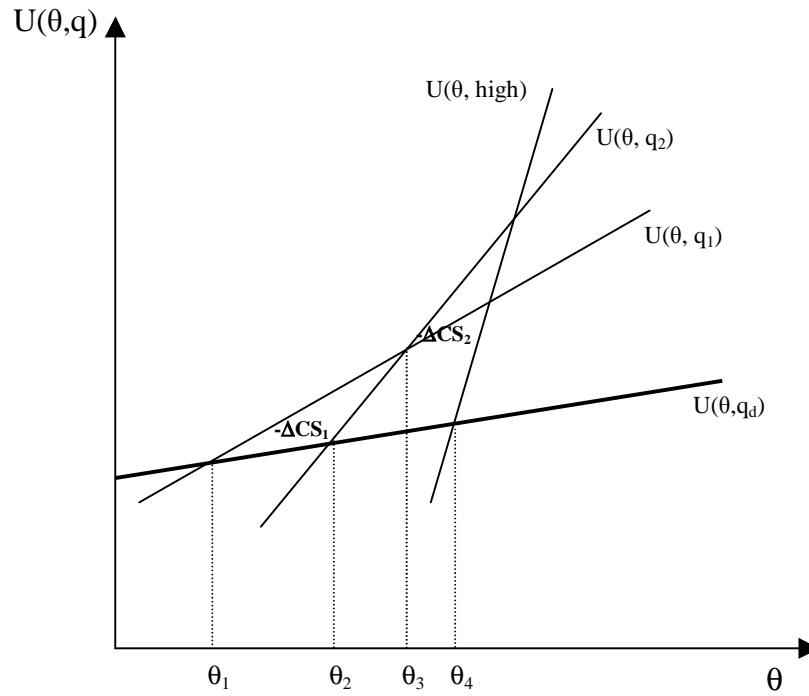
Figure 5: Discrimination against Country 1

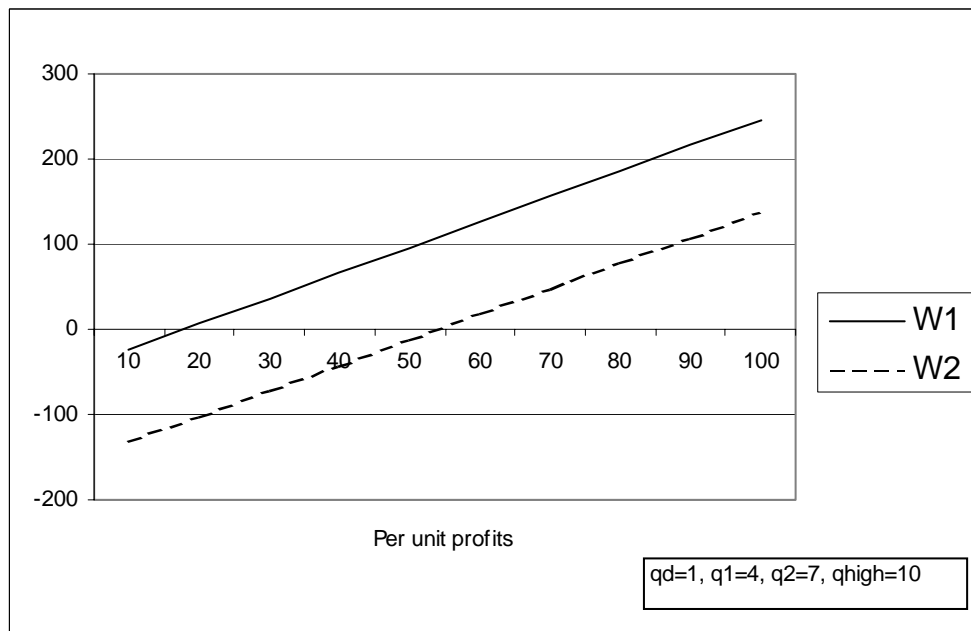Figure 6: Discrimination against Countries 1 and 2

Figure 7: Change in Social Welfare from Discrimination against Countries 1 and 2