Preliminary
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Screen Quota and Recent Success in Korean Film Production

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I. Introduction

Screen quota has long been one of the hot issues in multilateral and bilateral trade negotiations. In GATT, cinematograph films were agreed upon as an exception to "national treatment". Even in WTO, which was conceived as a substitute for GATT to include service industry that has been outside GATT's reach, liberalizing trade in films has not been agreed upon yet. A bilateral investment treaty between Korea and US is in stalemate due to the disagreement between the two parties on deregulation of trade in films.

Proponents of the restrictive policy argue that, in the absence of screen quota, local producers in most nations would be swept away by foreign filmmakers, especially Hollywood majors.[1] Thus, governmental intervention is necessary to ensure the survival of domestic producers and to guarantee that national media content reflects domestic culture and other national interests. Schiller (1969) argues that free trade is the mechanism by which a powerful economy penetrates and dominates a weaker one and the free flow of information is the channel through which life styles and value systems can be imposed on poor and vulnerable societies.

On the other hand, opponents to screen quota argue that film industry is just one example of many commercial industries and, furthermore, free trade will develop local business environment that will eventually lead to more competitive local film production. In the context of television programs, Waterman (1988) argues that liberalization of local market would stimulate the demand for US-made programs in the short run but

[1] It is reported that 6 majors control about 80% of the total revenues of world film industry.

later the development of infrastructures promoted by imported programs would benefit domestic production industry relatively more than they benefit foreign producers because audience prefer local programs to imported ones due to cultural and linguistic differences.

This paper approaches screen quota with an economic perspective. We will employ a model of trade in monopolistically competitive industry (see Krugman (1980) for a general model and Wildman and Siwek (1988) for a model developed specifically for trade in films) in order to discuss the effects of screen quota. As Wildman and Siwek (1988), we focus on the public good nature of theatrical films enabling the films produced and shown in one country to be on the screen in other countries without a significant cost.

The remaining of this paper is organized as follows. In section II, we give a brief overview of Korean film industry. A basic model of trade in films is presented in section III. An effect of screen quota is analyzed in section IV. Finally, section V concludes.

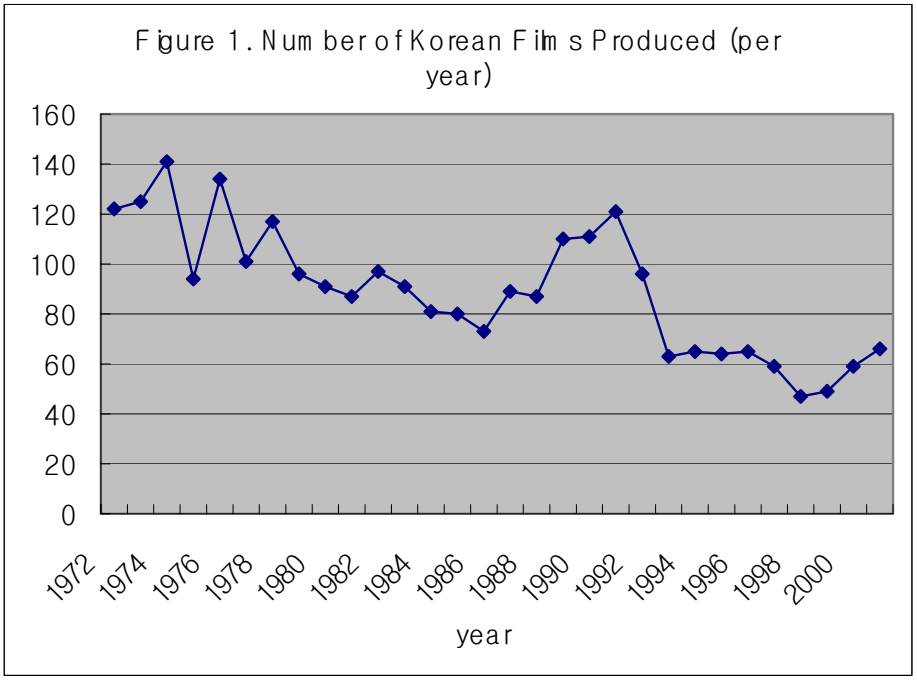
II. An Overview of Korean Film Industry

In Korea, screen quota, or more precisely, a mandatory period for locally produced films (MPL), has been in place from 1958. At the outset, theater operators were required to show Korean films at least 90 days (and 6 films) per year. Later, MPL was extended twice: 121 days in 1973 and 146 days in 1985. Minister of Culture and Tourism and a local governor can reduce MPL by up to 40 days together considering, for example, theaters showing local films in a high demand period.

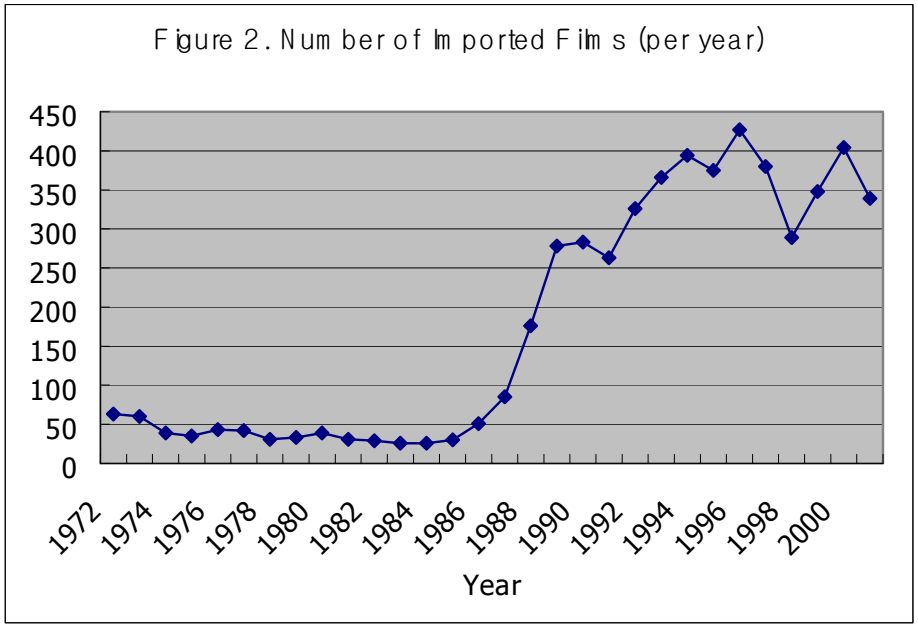
In 1987, Korean government opened its film distribution market for foreign film

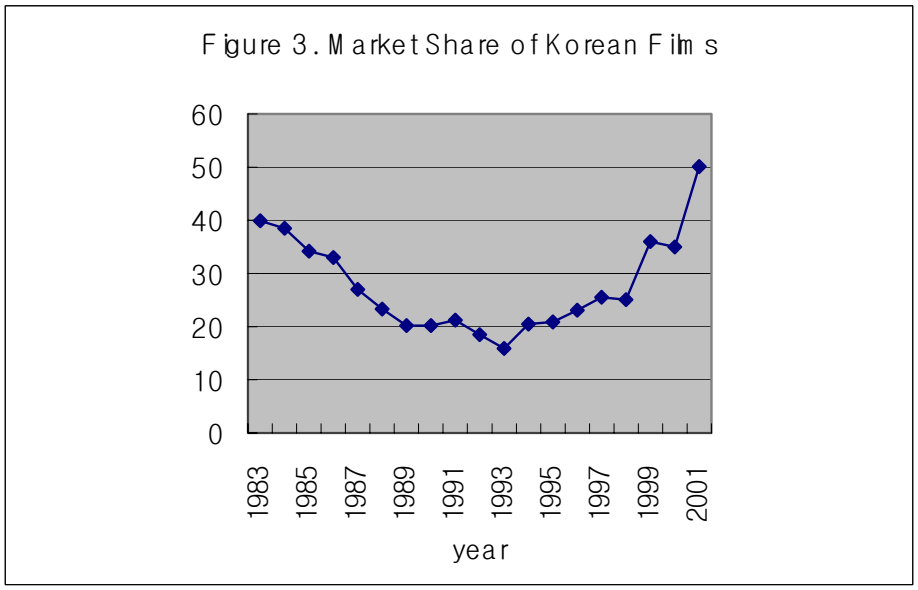
distributors. Since government gave import rights to filmmakers based on the number of local films they produced, filmmakers merely kept making movies for the purpose of earning import rights. Screen quota made it relatively easy for Korean films to be shown in theater.[2]

Overall, the number of films produced in Korea is dropping steadily with recent rebound in late 1990's (Figure 1). Meanwhile, the number of imported films has sharply increased during late 1980's and 1990's (Figure 2). However, the market share of local films is increasing since around 1993 (Figure 3).



[2] See Kim et al (1998) for this argument.





It is often argued that emerging new delivery systems such as VCR and cable television added the windows in which the films can be distributed and, thus, increased profits for filmmaking, which attracted the investment from Chebols and venture capital

financing companies. New money and new generation of producers combined their forces and started to make films that would sell in a competitive market. In addition, the deregulatory policies such as liberalization of distribution were gradually affecting the business environment for filmmakers.

III. A Basic Model of Trade in Films

We modify the model in Wildman and Siwek (1988) considering that Korea is a small country. Consider an economy with two countries: Country A and Country B. It is assumed that the market potential of film industry each country is fixed which is denoted by R_i for $i = a, b.$[3] Country B is assumed to have a sufficiently larger market potential than Country A. As a consequence, (i) firms in Country B export films to Country A while firms in Country A serve their domestic market only and (ii) exporting films to Country A does not have an influence on production decisions by the firms in Country B. As argued by Wildman and Siwek (1988), a filmmaker in a country with a larger market potential produces a film with a larger budget appealing enough to overcome cultural and linguistic differences and attract foreign audiences. Similarly, when a country has a sufficiently small market potential, local firms in the country may not be able to export their films abroad. (ii) is a typical simplifying assumption when we consider a small country.

There are an infinite number of potential firms in each country. All firms are integrated filmmaker-distributors that handle only one film each period. It is assumed that all the firms in the economy are symmetric in terms of production and distribution

[3] Here and in what follows, subscript $i = a, b$ stands for Country A and B, respectively.

technologies.

Audience appeal of firm j (or, its film) is determined by its expenditure (or, budget), E_j, on inputs such as directors, actors, scriptwriters, special inputs and so on.[4] Specifically, it is assumed that the market share of a firm is directly proportional to the portion of its expenditure among total expenditures of the films shown in a given period. A firm incurs a fixed cost, K, per period for maintaining distribution networks. We assume that the market potential is sufficiently greater than the fixed cost, that is,

$$R_i > 4K \quad \text{for } i = a, b. \tag{A.1}$$

When (A.1) does not hold, firms do not allocate a positive amount of budget for film production, which will be clear from the following discussion. Finally, a transportation cost for importing a foreign film is assumed to be zero.[5]

1. Autarky

Consider a firm (say, firm j) in Country A where import of foreign films is prohibited. The firm maximizes its profit taking the number and the expenditures of its competitors as given, that is,

[4] Of course, some films with a high budget (expenditure) fail to appeal to a large number of audiences. Notwithstanding, on average, we can still consider this assumption as a realistic one.

[5] Typically, information products have a negligible transportation cost.

$$\max_{E_j} \frac{R_a E_j}{\sum_{1}^{N_a} E_i} - E_j - K, \tag{1}$$

where N_a denotes the number of firms including firm j making films in Country A. The first order condition is

$$R_a\left(\sum_{1}^{N_a} E_i - E_j\right) = \left(\sum_{1}^{N_a} E_i\right)^2. \tag{2}$$

Free entry drives down monopolistic profits to zero, or

$$\frac{R_a E_j}{\sum_{1}^{N_a} E_i} - E_j - K = 0. \tag{3}$$

Using the symmetry of firms, (2) and (3) can be rewritten as follows,[6]

$$E = \frac{N_a - 1}{(N_a)^2} R_a, \tag{2'}$$

$$E = \frac{R_a}{N_a} - K. \tag{3'}$$

From (2') and (3'), we can solve for a competitive equilibrium with autarky, $\left(E_a^A, N_a^A\right)$, given as

[6] Due to the symmetry, subscript j is omitted in the following equations.

$$E_a^A = \left(\sqrt{\frac{R_a}{K}} - 1 \right) K, \qquad N_a^A = \sqrt{\frac{R_a}{K}} \,. \tag{4}$$

Proposition 1.[7]

In a country with a larger market potential, firms produce a greater number of films with higher budgets. When the cost of maintaining a distribution network goes up, the number of films produced goes down while the average budget of films increases when (A.1) holds.

Proof: It is straightforward from differentiation of (4) with respect to R_a and K. Q.E.D.

2. Free Trade

Now we allow import of films from Country B where N_b films with a budget, E_b, are produced. As in Wildman and Siwek (1988), due to the linguistic and cultural differences, foreign films have a handicap in competition with domestic films. Linguistic differences may be overcome by subtitling or dubbing, but at a substantial cost. We incorporate this by discounting a budget of a film, which is a measure of appeal of the film, by h ($0 < h < 1$).

Since exporting films to Country A does not influence production decisions by firms in Country B, we can view that firms in Country B are facing a similar decision problem as the firms in Country A with autarky. Thus, we have

[7] This is exactly what is shown by Wildman and Siwek (1988).

$$E_b = \left(\sqrt{\frac{R_b}{K}} - 1\right)K, \qquad N_b = \sqrt{\frac{R_b}{K}}\,. \tag{5}$$

According to Proposition 1, we have $E_a^A < E_b$ and $N_a^A < N_b$ since the market potential of Country B is the larger than that of Country A.

With free trade in films, firm j in Country A solves the following problem,

$$\max_{E_j} \frac{R_a E_j}{\sum_1^{N_a} E_i + (1-h)N_b E_b} - E_j - K\,. \tag{6}$$

Given the following first order condition (7), a free-entry condition and the symmetry of firms,

$$R_a\left(\sum_1^{N_a} E_i + N_b E_b - E_j\right) = \left(\sum_1^{N_a} E_i + N_b E_b\right)^2, \tag{7}$$

we can find a free trade equilibrium, $\left(E_a^F, N_a^F\right)$, given as

$$E_a^F = \left(\sqrt{\frac{R_a}{K}} - 1\right)K, \quad N_a^F = \sqrt{\frac{R_a}{K}} - \frac{(1-h)N_b E_b}{\sqrt{K}\left(\sqrt{R_a} - \sqrt{K}\right)} \quad \text{if} \quad h > h_1\,, \tag{8}$$

where $h_1 = 1 - \dfrac{\sqrt{R_a}\left(\sqrt{R_a} - \sqrt{K}\right)}{N_b E_b}$. When $h \le h_1$, there is no local production of films,

that is, $E_a^F = N_a^F = 0$. When both local and foreign films serve Country A, the market share of locally produced films, MS_a^F, can be obtained as

$$MS_a^F = R_a - \frac{(1-h)N_b E_b \sqrt{R_a}}{\sqrt{R_a} - \sqrt{K}}. \tag{9}$$

Finally, it can be shown that the revenue of a firm in Country B from exporting at least covers the fixed cost (K) if

$$h \le h_2 = 1 - \sqrt{\frac{K}{R_a}}. \tag{10}$$

Otherwise, firms in Country B do not export films to Country A. Note that following relationship holds,

$$h_1 \le h_2 \quad \text{if} \quad \frac{\sqrt{R_b}\left(\sqrt{R_b} - \sqrt{K}\right)}{\sqrt{R_a}\left(\sqrt{R_a} - \sqrt{K}\right)} \le \sqrt{\frac{R_a}{K}}. \tag{11}$$

Discussions so far can be summarized as in the following proposition.

Proposition 2.

(i) case 1: $h_1 \le h_2$

$h < h_1$: import only

$h_1 \le h \le h_2$, domestic production and import

$h > h_2$, domestic production only

(ii) case 2: $h_1 > h_2$

$h < h_2$: import only

$h_1 \le h \le h_2$, no domestic production or import

$h > h_1$, domestic production only

With free trade, a smaller number of films are produced in Country A than in autarky $\left(N_a^F < N_a^A\right)$ while the average size of the budgets is unaffected when local production occurs. With free trade, firms in Country A have to share domestic market potential with foreign firms leading some of the local firms to exit film industry. When the market potential of Country A goes up or audiences more heavily discount the appeal of foreign films, local production of film increases. Finally, when the fixed cost, K, increases, the market share of local films goes down.

Imposing quota on the import of films, or decreasing N_b, Country A can increase local production of films and the market share of domestic films. This result contrasts with the one when government imposes MPL. We will return to this point in the following section.

We do not intend to perform complete welfare analysis of two different trade regimes. To do that, we need to consider trade-offs between the increase in total number films shown and the decrease in locally produced films reflecting local culture

and interests due to the import of foreign films.[8] This is beyond the scope of this paper.

IV. A Mandatory Period for Locally Produced Films

Suppose a time period (say, one year) can be divided into two sub-periods: sub-period 1 and 2. We slightly modify the model in the previous section by letting a local firm produce a film in a sub-period. We consider a mandatory period for locally produced films (MPL) with which the government of Country A determines the lengths of two sub-periods and force firms to show only locally produced films in sub-period 1 while imported films can also be shown in sub-period 2. That is, in sub-period 2, firms can freely show either imported or local films. Let $\alpha(1-\alpha)$ represent the relative length of sub-period 1(2), respectively, with $0 < \alpha < 1$.

The fixed cost, K, is allocated to two sub-periods in proportion to the relative length of them: α and $1-\alpha$. Hence, a firm incurs αK and $(1-\alpha)K$ for maintaining distribution networks in sub-period 1 and 2, respectively.

In reality, the market potential may not be uniformly distributed over a period. For example, December with holidays and school vacations may have disproportionately high market potential. Considering this, we let the market potential of Country A in sub-period i be denoted by R_i for $i = 1,2$ with $R_a = R_1 + R_2$. Assuming sub-period 2 is a high demand season, we have

$$R_1 < \alpha R_a \qquad \text{and} \qquad R_2 > (1-\alpha)R_a . \tag{A.2}$$

[8] If we ignore the nationality of films, the welfare of Country A obviously goes up with free trade since consumer welfare increases with the variety (number) of films while producer surplus is zero in both trade regimes.

It is also assumed that the total expenditures on film production, $N_b E_b$, in Country B are divided into two sub-periods in proportion to the lengths of the sub-periods.[9]

For the purpose of comparison, using (8), we first find $\left(E_1^F, N_1^F, E_2^F, N_2^F\right)$, equilibrium in Country A with free trade in each sub-period,

$$\begin{aligned} E_1^F &= \left(\sqrt{\frac{R_1}{\alpha K}} - 1\right)\alpha K, & N_1^F &= \sqrt{\frac{R_1}{\alpha K}} - \frac{\alpha(1-h)N_b E_b}{\sqrt{\alpha K}\left(\sqrt{R_1} - \sqrt{\alpha K}\right)}, \\ E_2^F &= \left(\sqrt{\frac{R_2}{(1-\alpha)K}} - 1\right)(1-\alpha)K, & N_2^F &= \sqrt{\frac{R_2}{(1-\alpha)K}} - \frac{(1-\alpha)(1-h)N_b E_b}{\sqrt{(1-\alpha)K}\left(\sqrt{R_2} - \sqrt{(1-\alpha)K}\right)}. \end{aligned} \tag{12}$$

And, the resulting market share of local films, MS_a^F, is

$$\begin{aligned} MS_a^F = R_1 + R_2 &- \frac{(1-h)\sqrt{R_2}N_b E_b}{\sqrt{R_2} - \sqrt{(1-\alpha)K}} \\ &+ \alpha(1-h)N_b E_b\left[\frac{1}{1-\sqrt{(1-\alpha)K/R_2}} - \frac{1}{1-\sqrt{\alpha K/R_1}}\right]. \end{aligned} \tag{13}$$

With MPL, Country A can be viewed as a closed (open) economy in sub-period 1(2), respectively. Note that it is an optimal strategy for filmmakers in Country B to export the films produced in sub-period 1 in the following period. It can be shown that export revenues cover the fixed cost if

[9] The main result of this paper does not change without this assumption.

$$h \le h_3 = 1 - \frac{(1-\alpha)K\left[\sqrt{R_2} - \sqrt{(1-\alpha)K}\right]}{\sqrt{R_2}\left(\sqrt{KR_b} - K\right)}. \tag{14}$$

for those films. Using (4) and (8), an equilibrium with MPL, $\left(E_1^M, N_1^M, E_2^M, N_2^M\right)$, can be characterized as follows

$$\begin{aligned} E_1^M &= \left(\sqrt{\frac{R_1}{\alpha K}} - 1\right)\alpha K, & N_1^M &= \sqrt{\frac{R_1}{\alpha K}}, \\ E_2^M &= \left(\sqrt{\frac{R_2}{(1-\alpha)K}} - 1\right)(1-\alpha)K, & N_2^M &= \sqrt{\frac{R_2}{(1-\alpha)K}} - \frac{(1-h)N_b E_b}{\sqrt{(1-\alpha)K}\left(\sqrt{R_2} - \sqrt{(1-\alpha)K}\right)}, \end{aligned} \tag{15}$$

when (14) holds. Otherwise, $E_2^M = N_2^M = 0$. Focusing on the case where (14) holds, the market share of local films with MPL, MS_a^M, is

$$MS_a^M = R_1 + R_2 \frac{N_2^M E_2^M}{N_2^M E_2^M + (1-h)N_b E_b} = R_1 + R_2 - \frac{(1-h)\sqrt{R_2}N_b E_b}{\sqrt{R_2} - \sqrt{(1-\alpha)K}}. \tag{16}$$

Compared to the equilibrium with free trade, local production increases (decreases) in sub-period 1(2) while the size of budget of a film remains constant in both sub-periods. MPL increases the market share of local films over free trade equilibrium if

$$MS_a^M - MS_a^F > 0 \quad \Rightarrow \quad \alpha > \frac{R_1}{R_1 + R_2}. \tag{17}$$

In other words, MPL may reduce the market share of local films when the MPL is not

set at a sufficiently long period of time. When MPL is not long enough, the gains of market share from barring import of foreign films in sub-period 1 can be dominated by the loss of market share in sub-period 2.

Given α and R_a constant, as R_2 increases or, the market potentials are more unevenly distributed over two sub-periods, the market share of local films is more likely to rise over the equilibrium with free trade [see (16)]. It can be attributed to the effect that the increase in R_2 gives rise to the increase in total expenditure $\left(N_2^M E_2^M\right)$ by local firms and, as a consequence, their share of the market potential in sub-period 2.

This result also provides some policy implications. It is often argued that foreign films are usually shown on a high season and circumvent MPL restrictions in a certain degree. Considering this, Korean government provides incentives to firms to show local films in a high-demand season by reducing MPL by 20 days per year when firms show local films in a high-demand season. However, according to the result above, it might undermine the efficacy of MPL restriction.

V. Concluding Remarks

This paper has shown that MPL instead of quota in a strict sense may bring about a decrease in the market share of locally produced films contrary to its intended purpose of promoting it. Rather, direct quota of foreign films to be imported can achieve the policy objective. This effect may occur especially when local films can compete more or less successfully with foreign films with free trade.

In order to evaluate the overall effects of MPL or screen quota, in general, we need

to take into account a several aspects of screen quota. First of all, we have to consider positive effects of import of foreign films that facilitates development of local infrastructure of film industry such as theaters and ticketing systems. Also, we assumed that there are only two countries and that Country A is a small country so that imposition of screen quota does not change foreign producers' investment decisions. However, if many small countries introduce restrictive policies toward foreign films, then it might decrease foreign producers' investment and their local consumer welfare.

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