

CULTURAL AND OTHER BARRIERS TO MOTION PICTURES TRADE

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The global success of the American film industry facing rising costs of production, foreign protectionism, and liberal trade policies at home is an enigma. The basis for American dominance is found in market size and structure. In turn, market characteristics and microdata explain protectionist strategies—leading to a complex gravity-iceberg model of U.S. exports. Besides purchasing power and spatial distance, cultural variables as well as protectionist strategies are important influences on U.S. motion pictures trade. Competitors nonetheless fail to match the magical American combination of movie stars, economies of scale, and popularity of English speech. (JEL F14, C33, Z10)

I. INTRODUCTION

The U.S. motion picture industry has long dominated world markets, but its recent expansion has been especially dramatic. Hollywood's current share of the world film market has doubled since just 1990, whereas the European film industry is about one-ninth the size it was in 1945. In the 1960s foreign films constituted 10% of the U.S. market; by 1986 they made up 7%, and today only about three-quarters of 1%. Remarkably, the global dominance of American films has evolved despite extensive protectionist efforts by other countries and virtually no barriers to trade by the United States. As to other countries, we might expect to find much more active, effective protectionism against a culturally sensitive product than against generic products and services. The characteristics of the product would suggest that the fate of U.S. motion picture exports would have at least mirrored the decline in American textiles and steel. To the contrary, the U.S. motion picture industry has been winning the global ballgame despite three strikes against it—protectionism, rising real domestic costs, and relatively stable real domestic ticket prices.

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We address this quandary of why protectionism fails in a cultural industry where protectionism is expected to succeed. We do so first by examining the structure of the U.S. domestic motion picture industry. As it turns out, this structure provides a special impetus for exports. We next examine the nature of protectionism in a world of soaring demand for films. In this setting the American movie is a world product in a different sense than, say, the automobile. The American movie is a world product because its *presence* is dominant; the automobile is a world product mostly because its parts are interchangeable. By its nature the American movie appears to have few substitutes, even though Hollywood can use foreign locales for filming.

American movies encounter different protectionist strategies in different places. The divides fall either side of highly industrialized nations versus less developed nations, English-speaking versus non-English-speaking people, literate versus less literate people, and so on. Some countries and regions combine fees with subsidies, whereas others engage in piracy, quantitative, or service restrictions. Few countries have traditional tariffs.

Once we have defined the characteristics of the U.S. movie industry and foreign strategies

ABBREVIATIONS

MPAA: Motion Picture Association of America
LDC: Less Developed Country
GDP: Gross Domestic Product
VIF: Variance Inflation Factor

of protectionism, we can better identify the relevant variables and appropriate models to explain not only industry exports but also the failure of protectionism. We end up with a complex gravity-iceberg model as a method of estimating U.S. motion picture exports. Because of the nature of the industry, our approach shares some of the characteristics of earlier studies in which economies of scale and imperfect competition are present. Although early gravity models have focused on spatial distance, some economists have interpreted the effects of “distance” as possibly nonphysical. Thus, “cultural distance” applied to a culturally sensitive industry could be a reasonable interpretation for distance effects. After using microdata to explore protectionist strategies, we then aggregate these data for the formal model.

II. STRUCTURE OF THE U.S. MOTION PICTURES INDUSTRY: WHY EXPORT?

What determines the structure and size of market for American films? Movie studios are both producers and distributors. Though movie studio revenues depend directly on *net* revenues (gross revenues minus total costs), the *size* and extent of the movies market remain tightly linked to *gross* revenue, including domestic box office. From the perspective of the studios, aggregate market size (S) is

$$(1) \quad S = \sum_{i=1}^n (R_i + X_i),$$

where R_i is gross domestic box office and X_i is the U.S. dollar value of exports (rentals, video tapes) of the i th of n movie studios. Compare the American studios' gross revenue with the circulating capital required by a major producer-distributor to supply the requisite number of films, and write the ratio

$$(2) \quad s = \sum_{i=1}^n (R_i + X_i) / K_j,$$

where K_j is the optimal circulating capital (including that required to pay stars and cast) for the j th or representative studio.¹

1. Each film project usually requires new sets, scripts, stars, other cast members, special effects, and location; thus, fixed capital is minimal compared with the circulating capital assigned to a new project. Thus the classical economists' definition of capital is applicable.

The value of s is an important measure of *industry structure*, where generally $\infty > s > 0$. If for a given K_j , $s \rightarrow \infty$, the global market could support many studios and the industry would be perfectly competitive. If, at the other extreme, $s = 1$, a monopoly studio can supply the global consumer market.

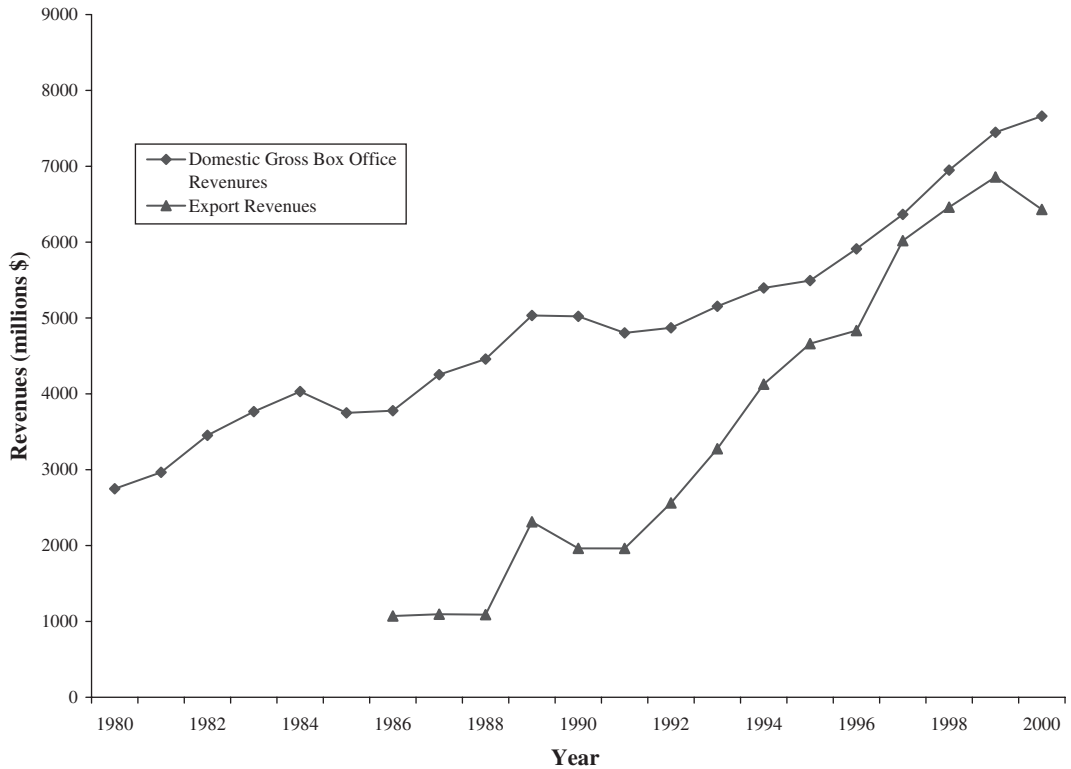
Although our pooled trade data set will encompass 1991–95, our selected stylized facts of the U.S. motion picture industry are based on available data. Figure 1 presents gross domestic box office revenues in current dollars (Motion Pictures Association of America, MPAA) and export earnings (*Variety*) in the industry. Despite some volatility, the trend in both variables is upward. During 1980–2000 nominal domestic box office revenues have increased by a multiple of nearly 2.8. Canterbury and Marvasti (2001, p. 94) estimate a price elasticity of demand for movie attendance between -0.23 and -0.51 , suggesting highly inelastic demand so that a doubling in nominal ticket prices has contributed significantly to revenues. They (p. 96) also find that a 1% increase in a “star index” raises admissions by about 2.3 million and domestic box office by about \$30 million.² Price inelasticity may be one measure of successful differentiation through nonprice competition (via stars, special effects, advertising, and promotion) by the major studios.³ Canterbury and Marvasti also find significant negative effects on demand and on total revenue from per capita income increases, suggesting that movies may be inferior goods in a wealthy country.

In the past two decades the American industry has not only benefited from growth in secondary markets (because of the popularity of VCRs and cable TV) but also from Adam Smith's “extent of market.” Export data in Figure 1 show a steep rise in revenues from foreign markets rapidly converging on

2. The Canterbury-Marvasti (2001) star index is based on star recognition from an original survey of moviegoers combined with the number of appearances of the particular star. The major studio/distributors distinguish themselves through their efforts to produce “hits” or blockbusters. In an important empirical study De Vany and Walls (1997, p. 787) find only 20% of a weekly Top 50 sample of films earning 80% of total box office receipts, with the top 4 movies generating a fifth of total box office revenue.

3. A model of the structure of the domestic industry and the complex relationship between major studios and exhibitors also is presented in Canterbury and Marvasti (2001). Domestic economies of scale are achieved through the variable capacity (number of seats) in theaters (exhibition sites).

FIGURE 1
U.S. Domestic and International Box Office Revenues



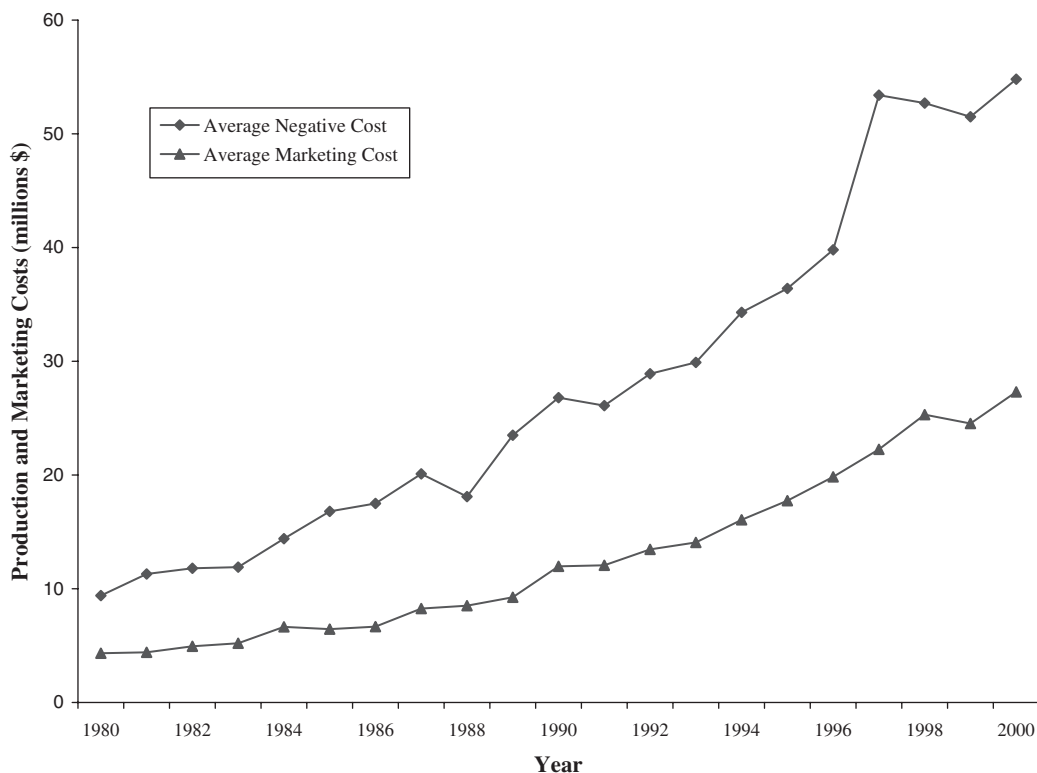
domestic gross box office revenues. Americans, however, appear to show little interest in foreign films: Imports are so insignificant that they are not even reported by the MPAA.

The American industry's motivation for seeking foreign markets is found in domestic box office, average costs, and industry structure. Cost figures (in current dollars) for members of the MPAA, comprised of the "majors" and usually including only the top seven to eight studios, are reported in Figure 2. Along with export growth, the industry has experienced remarkably rapid cost increases—a dual experience in sharp contrast to manufacturing industries, such as textiles and steel. Because most of the cost of physical production (which includes the cost of stars and cast) is incurred in producing the master copy (replicated at low cost in the United States), mostly marketing costs are incurred for exports that potentially add much more to revenues than to costs. Thus economies of scale in distribution are enhanced with increasing exports.

Because of the apparent dependency of domestic box office (R) on a high level of circulating capital (K_j), it is not surprising to find the global leader in films to be a country whose real gross domestic product (GDP) averaged 13.8 times that of its competitors during 1991–95 while the comparable per capita GDP ratio was 1.8. Although wealth levels may be important in establishing the industry, per capita income levels beyond relatively high levels have limited benefits for what appears to be an inferior good. Exports enlarge the total market ($R + X$) relative to optimal circulating capital costs [s in equation (2)], and therefore maintain the number of major studios that survive in a climate of soaring costs.

In 1990 the share of market for the top eight U.S. studios (the majors) was 89.2% of domestic box office and in 1997, 90.6% (*Variety*). Gross revenue for these majors, prorating exports, would have been \$6,230.4 million in 1990 and \$11,220.7 million in 1997 (current dollars). Between 1990 and 1997 nominal average costs of MPAA members more than

FIGURE 2
U.S. Production and Marketing Costs



doubled. Using our formula for s and the average cost data from Figure 2, s equals 8.14 in 1990, meaning that eight major studios could have broken even but instead enjoyed substantial profits. Because of soaring costs and despite rising domestic box office revenues, the estimated s for 1997 equals only 5.4, making foreign revenue more critical for the profitable survival of as many as eight majors. (The majors suffered heavy losses in 1997.) As a result, by 2000 the major studios began to release films simultaneously in domestic and foreign markets.

Although the incentive for U.S. exports of films and videos emanates from the characteristics of the industry and its markets, it is beyond our scope to delve further into such details. We are content rather to suggest that major Hollywood studios can profit from product differentiation requiring rising costs accommodated by a Smithian extent of market enhanced by foreign film revenues. The foreign market further extends economies of scale in distribution.

III. PROTECTIONIST STRATEGIES IN THE MOVIE INDUSTRY

Just as movies differ from textiles or steel, trade barriers in the motion picture industry do not exactly conform to those in other industries. Although the U.S. has used tariffs to limit movie imports in the past, virtually no barriers have existed in recent years. In turn, the nature, magnitude, and strategic choices countries make to limit U.S. films vary. In Saudi Arabia, public exhibition of movies is strictly banned for religious reasons; in China, several hidden quantitative restrictions limit the importation of Western movies; in India, severe quantitative restrictions limit film imports; in Thailand, imposed duties are mostly based on number of meters of imported films; and in many European countries a complex system of subsidies and taxes exists (MPAA 1991–96). As a more general guide, various protectionist measures are defined by country in Table 1 along with the average annual number of films produced during 1991–95. Excluding India, the United States dominates in number of films.

TABLE 1
Descriptive Statistics of Trade Barriers and Number of Films by
Cross-Sectional Units (1991–95)

| Countries | Tariffs* | Quantitative Restrictions* | Lack of Property Rights* | Video Levy* | Subsidies* | Service Barriers* | TBN | TBI | Number of Films Produced |
|--|----------|-------------------------------|--------------------------------|----------------|------------|----------------------|------|------|--------------------------------|
| Western Europe | | | | | | | | | |
| Belgium-Luxembourg | 0 | 0 | 1 | 1 | 1 | 0 | 3 | 6.0 | 8.5 |
| France | 0 | 1 | 1 | 1 | 1 | 1 | 5 | 9.6 | 155.5 |
| Germany | 0 | 0 | 1 | 1 | 1 | 0 | 3 | 6.0 | 65.8 |
| Italy | 0 | 1 | 1 | 0 | 1 | 1 | 4 | 9.6 | 106.4 |
| Netherlands | 0 | 0 | 1 | 1 | 1 | 0 | 3 | 4.0 | 14.6 |
| Norway | 0 | 0 | 0 | 1 | 1 | 1 | 3 | 4.6 | 10.8 |
| Spain | 0 | 1 | 1 | 1 | 0 | 1 | 4 | 8.0 | 55.0 |
| Sweden | 0 | 0 | 1 | 1 | 0 | 0 | 2 | 4.0 | 23.6 |
| Switzerland | 0 | 1 | 1 | 1 | 1 | 0 | 4 | 7.0 | 35.4 |
| United Kingdom | 0 | 1 | 1 | 0 | 0 | 0 | 2 | 6.0 | 58.8 |
| Group average | 0.00 | 0.50 | 0.90 | 0.80 | 0.70 | 0.40 | 3.30 | 6.48 | 53.44 |
| North America | | | | | | | | | |
| Canada | 0 | 1 | 1 | 0 | 1 | 1 | 4 | 9.0 | 31.0 |
| Mexico | 1 | 1 | 1 | 0 | 0 | 1 | 4 | 8.6 | 31.0 |
| Group average | 0.50 | 1.00 | 1.00 | 0.00 | 0.50 | 1.00 | 4.00 | 8.80 | 31.00 |
| South America and Caribbean | | | | | | | | | |
| Argentina | 0 | 1 | 1 | 0 | 1 | 1 | 4 | 8.6 | 14.7 |
| Bermuda | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2.0 | 0.1 |
| Brazil | 1 | 1 | 1 | 0 | 0 | 1 | 4 | 7.6 | 11.0 |
| Chile | 0 | 0 | 1 | 0 | 0 | 0 | 3 | 3.0 | 1.5 |
| Venezuela | 0 | 1 | 1 | 0 | 0 | 0 | 2 | 6.4 | 5.5 |
| Group average | 0.20 | 0.60 | 0.80 | 0.00 | 0.20 | 0.40 | 1.80 | 5.52 | 6.56 |
| Middle East | | | | | | | | | |
| Israel | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 2.0 | 14.0 |
| Saudi Arabia | 0 | 1 | 1 | 0 | 0 | 0 | 2 | 9.0 | 0.1 |
| Group average | 0.00 | 0.50 | 1.00 | 0.00 | 0.00 | 0.00 | 1.50 | 5.50 | 7.05 |
| Asia | | | | | | | | | |
| China | 0 | 1 | 1 | 0 | 0 | 0 | 2 | 5.6 | 179.5 |
| Hong Kong | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 2.0 | 197.6 |
| India | 0 | 1 | 1 | 0 | 1 | 0 | 3 | 8.4 | 827.3 |
| Indonesia | 1 | 1 | 1 | 0 | 0 | 1 | 4 | 9.4 | 37.8 |
| Japan | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 3.0 | 249.6 |
| Republic of Korea | 1 | 1 | 1 | 0 | 0 | 0 | 3 | 8.6 | 68.0 |
| Malaysia | 0 | 1 | 1 | 0 | 0 | 0 | 2 | 5.0 | 14.2 |
| Philippines | 0 | 1 | 1 | 0 | 0 | 0 | 2 | 7.0 | 125.0 |
| Singapore | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 2.0 | 0.1 |
| Taiwan | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 5.0 | 30.4 |
| Thailand | 1 | 0 | 1 | 0 | 0 | 0 | 2 | 5.0 | 53.5 |
| Group average | 0.27 | 0.64 | 0.91 | 0.00 | 0.09 | 0.09 | 2.00 | 5.55 | 162.09 |
| Others | | | | | | | | | |
| New Zealand | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2.0 | 5.2 |
| South Africa | 0 | 0 | 1 | 0 | 1 | 0 | 2 | 4.0 | 0.1 |
| Australia | 0 | 1 | 1 | 0 | 0 | 0 | 2 | 5.0 | 25.4 |
| Group average | 0.00 | 0.33 | 0.67 | 0.00 | 0.33 | 0.00 | 1.33 | 3.67 | 10.23 |

*One denotes that a trade barrier exists, and zero if it does not.

The selected trade barriers include violations of private property rights (or existence of piracy), quantitative restrictions, tariffs, video levies, subsidies, and service barriers, such as printing and dubbing restrictions. These barriers are measured by geographical area (group averages) as well as by specific country.

The tariff, the most common barrier to most trade, is not used in Western Europe, Canada, or the Middle East. It is deployed in Brazil, Indonesia, the Republic of Korea, and Thailand. If U.S. movies demand abroad is also generally price-inelastic, tariffs probably are viewed as ineffectual in much of the world. Where tariffs are used, they may be used simply as a source of tax revenue. Otherwise, quantitative restrictions are widely used as a substitute for tariffs. Our neighbors in North America (Canada, Mexico) use quantitative restrictions more than any other region, closely followed by Asia and South America–Caribbean.

The most popular trade barrier is the denial of property rights. In 1997 the majors lost an estimated \$66 million in revenues to movie piracy in India alone (MPAA). Not only does film lend itself to piracy, black markets offer a way around quantitative barriers in the presence of strong demand for movies. The denial of property rights, however, is not confined only to countries using quantitative restrictions. Piracy is virtually universal; it is the protectionist strategy of choice everywhere except for Norway, Bermuda, Singapore, and New Zealand. These countries may have especially severe penalties for this trade violation.

The closest device to a tariff is the video levy—very popular in Western Europe, where subsidies for the industry are also pervasive. Most of Western Europe, like Canada, is striving to sustain its own movie industry. Only Spain and Sweden have such levies in the absence of subsidies. Much of the motivation for video levies is the provision of funds for subsidizing the domestic industry. Only Canada, Italy, Argentina, India, and South Africa have subsidies without levies. Excepting Argentina, South Africa, Belgium-Luxembourg, the Netherlands, and Norway, countries subsidizing domestic industries also produce a substantial number of films, with India producing by far the largest number. In these countries subsidies apparently are effective in supporting local film industries. China, Hong Kong, and Japan are major

Asian producers that do not subsidize their film industries; all three have very large populations, and Hong Kong and Japan have high per capita incomes. Like the United States, these countries are sufficiently large or affluent to sustain a domestic industry.

Service barriers are ubiquitous in North America and relatively important in Western Europe, South America, and the Caribbean. They are unimportant in the other geographical regions. It is difficult to generalize regarding country groupings. These complex barriers nonetheless appear along with many other barriers in individual countries, such as France, Italy, Norway, Spain, Canada, Mexico, Argentina, Brazil, and Indonesia. Spain has a complex dubbing license requirement, Argentina requires that printing and dubbing be done locally, and Brazil requires local printing even though its two printing labs operate at high costs. All these countries have expressed in various ways an interest in developing a sturdy domestic movie industry. Their motives appear to be a mixture of pride and fear of U.S. cultural dominance.

The mean values of trade barriers and average number of films that provide the most dramatic differences among population types appear in Table 2: (1) developed versus less developed countries, and (2) English-speaking versus non-English-speaking countries. The developed countries rely heavily on piracy and somewhat less on a combination of video levies and subsidies plus quantitative restrictions. A third of the developed countries use service barriers; they use *every* device *except* the tariff. Less developed countries (LDCs) rely about as much as developed countries on piracy and quite a lot more on quantitative restrictions (again, such restrictions may be much more effective than tariffs or levies, though tariffs are also deployed). About a fifth of LDCs use quite onerous service barriers. Non-English-speaking countries rely even more on property rights violations, and their quantitative restrictions are nearly twice as important as for English-speaking countries. About a third of the non-English countries also use video levies and subsidies as well as those harsh service barriers (dubbing being most relevant to these populations). Because most U.S. exports go to developed countries, the importance of piracy and subsidies infer a failing protectionist strategy.

TABLE 2
Mean Values of Trade Barriers and Number of Films by Country Group (1991–95)

| Countries* | Tariffs | Quantitative Restrictions | Lack of Property Rights | Video Levy | Subsidies | Service Barriers | <i>TBN</i> | <i>TBI</i> | Number of Films Produced |
|--------------------------------|---------|---------------------------|-------------------------|------------|-----------|------------------|------------|------------|--------------------------|
| Developed countries | 0.00 | 0.47 | 0.87 | 0.53 | 0.53 | 0.33 | 2.73 | 5.72 | 57.31 |
| Less developed countries | 0.28 | 0.67 | 0.89 | 0.00 | 0.22 | 0.22 | 2.33 | 5.96 | 88.74 |
| English-speaking countries | 0.00 | 0.38 | 0.63 | 0.25 | 0.25 | 0.13 | 1.50 | 4.00 | 39.79 |
| Non-English-speaking countries | 0.20 | 0.64 | 0.96 | 0.32 | 0.36 | 0.32 | 2.84 | 6.44 | 85.50 |

*There are 15 countries in the developed countries group, 18 in the LDC group, 8 in the English-speaking group, and 25 in the non-English speaking group. If 50% or more of the population speaks English, it is categorized as an English-speaking country, otherwise it is categorized as non-English.

Although the move from these microdata to index numbers usable in gravity-iceberg models risks the loss of some information, estimations that use the individual measures of trade barriers create a multicollinearity problem. Later we will address the concern regarding possible information losses. Meanwhile, because of the descriptive and complex nature of the data on trade barriers, two broad indices of trade restrictions are developed and used in our models. One measure is based on the number of various trade barriers imposed on U.S. exports of motion pictures (*TBN*), on scale of one to six. The other measure is based on the number as well as the complexity and levels of trade barriers (*TBI*), on a scale of 1 to 10. The *TBI* measure becomes important if the aggregate effect of restrictions facing U.S. filmmakers is greater than what simply the number of trade barriers indicates.⁴ We will refer to *TBN* as a numerical index and to *TBI* as a qualitative index. The values for these indices also appear in Tables 1 and 2 with summary definitions in Table 3. U.S. trading partners average about three forms of trade restrictions (*TBN*) on the imports of motion pictures, and their mean qualitative index (*TBI*) is nearly six.

The highest regional numerical index (*TBN*) is in North America (excluding, again, the United States), followed by Western Europe. Of individual countries, France has the largest value at five, followed closely by

Argentina, Brazil, Canada, Indonesia, Italy, Mexico, Spain, and Switzerland with four each. The qualitative index (*TBI*) also averages highest in North America, followed by Western Europe, with the Middle East and Asia not far behind. Of countries, the highest qualitative index number is 9.6 for France and Italy, respectively; followed by 9.4 for Indonesia; 9.0 for Canada and Saudi Arabia (movies taboo); 8.6 for Argentina, Mexico, and Republic of Korea; 8.4 for India; 8.0 for Spain; and 7.6 for Brazil. Excepting Saudi Arabia, all of the countries with high *qualitative* restrictions (including levies and subsidies) tend to have strong interests in developing or preserving their domestic movie industries. Except Saudi Arabia, they also typically appear to have well-developed domestic movie industries.

As we consider developed versus LDCs, *TBN* is somewhat higher in the developed countries, and the *TBI* is somewhat higher in the less developed world. The quantitative (*TBN*) restrictions are about twice as high in the non-English-speaking countries as in the English-speaking world. The ratio for the *TBI* index for the non-English- to the English-speaking countries is similar. The LDCs generally are more protectionist by these measures and are at the same time comprised of non-English-speaking people. Thus, the LDC classification and language are candidate measures of cultural differences affecting trade barriers.

The use of levies combined with subsidies and service barriers (in the presence of piracy) as a strategy against U.S. imports in countries desiring to expand their film industries suggests

4. Because, as noted, many different methods are used to restrict imports, simply the number of trade restrictions (*TBN*) is sometimes inadequate in capturing the severity of trade restrictions.

TABLE 3
Definition, Mean, and SD of Each Variable

| Variable | Definition | Mean (SD) |
|----------|--|------------------------|
| X | U.S. receipts from film and tape rentals in millions of dollars, each country in real terms | 85.26 (133.71) |
| IM | U.S. payments from film and tape rentals in millions of dollars to each country in real terms | 2.78 (6.83) |
| Y_i | U.S. GDP per capita in dollars, in real terms | 22,498.41 (672.95) |
| Y_j | Other country's GDP per capita in dollars, in real terms | 12,592.32 (9666.61) |
| ED | Adult literacy rate in other countries | 90.78 (11.86) |
| LAN | Percentage of English-speaking population in other countries | 14.33 (29.94) |
| REL | Percentage of population that is Judeo-Christian in other countries | 63.46 (44.05) |
| TBN | Numerical index or number of trade barriers, including tariff, subsidies, quantitative restrictions, piracy, video levy, and service barriers, ranging from zero to six, six being the highest | 2.83 (1.29) |
| TBI | Qualitative index of trade barriers allowing for number of barriers as well as their complexity, on scale of 1 to 10, 10 being the highest | 5.85 (2.52) |
| NFP | Number of films produced in other countries | 74.45 (147.37) |
| $INVR$ | Ratio of investment in motion pictures industry in other countries to GDP in other countries | 0.00015 (0.0002) |
| DIS | Air distance between the closest major U.S. city and the capital of each country in miles | 6111.23 (11,891.34) |
| LDC | Dummy for LDCs, one for LDC, zero otherwise | 0.5455 (0.50) |
| ADJ | Dummy for adjacent countries, one for adjacent, zero otherwise | 0.0606 (0.24) |

endogenous protectionism. The high qualitative restrictions in countries with a well-developed domestic industry suggest that the industry may have a special interest in pursuing such barriers to trade. Beyond this evidence we also consider explicit measures of the importance of film industries to countries. The ratio of investment in the motion picture industry to the level of GDP ($INVR$) as well as the number of films produced in each country (NFP) may represent the importance of the industry to special interest groups and thereby to policy makers.

IV. CULTURAL DISTANCE IN A GRAVITY-ICEBERG MODEL

Important characteristics of movies are consistent with the assumptions of gravity models, such as conditions of imperfect competition often associated with economies of scale in

production or distribution. However, another common assumption of such models is significant transport costs sometimes used as a measure of spatial distance. As it turns out, movies have negligible transport costs, but this does not rule out other kinds of costs from distance, such as cultural distance. We normally expect audiences to prefer movies that are produced in their native languages or which reflect their cultural values. Based on our overview of the U.S. industry, the main barrier to local movie production appears to be a sufficiently large domestic market and an adequate per capita income generating the economies of scale in exhibition that warrant high production costs.

From Samuelson's original iceberg model, X_{ij} becomes the value of country i 's film shipments that "arrive" at their destination, country j , having "melted down" a fraction from x_{ij} because of transportation costs and

distance between the countries. Although the value of x_{ij} cannot be observed, the image of a melting iceberg affirms the inverse relation between shipments and spatial distance. Because the cost of transporting film is negligible, however, we will interpret the meltdown as most likely the effect of cultural differences between countries. Simply expressed, the total meltdown will be a weighted average from the effect of all such cultural variables for the j th importing country. Thus, in general,

$$(3) \quad X_{ij} = \sum_{m=1}^M e^{-t_{ijm}} D_{ijm} x_{ij},$$

where the subscript m represents the m th of M independent cultural distance variables and t_{ijm} represents the weight of the m th cultural distance variable in the j th importing country. Furthermore, trade barriers can be included in this list of meltdown variables, barriers such as levies and subsidies in motion pictures often based on cultural considerations. Because of the nature of these meltdown variables, it can be safely assumed that $\sum_m e^{-t_{ijm}} D_{ijm} < 1$.

In Bergstrand's generalized gravity equation (1989, p. 146) and Krugman's location model (1995, p. 91) exports are positively related to the purchasing power of any country set but are inversely related to distance. By introducing Samuelson's iceberg effect from the independent variables, the complex gravity-iceberg export model becomes

$$(4) \quad X_{ij} = [k(Y_i Y_j / D_{ij}^b)] \left[\sum_{m=1}^M e^{-t_{ijm}} D_{ijm} x_{ij} \right],$$

where x_{ij} is country i 's receipts from motion pictures (in real terms) from country j , the Y s are the per capita incomes in the respective countries i and j , D_{ij} is the distance between countries i and j , and b is an exponent thought to be approximately one. In our equation, k is a coefficient of the entire term in brackets; if the coefficients of per capita income and distance were estimated separately, as in much of the gravity literature, k would be a scalar. The right-hand side of equation (3) is the second term on the right-hand side of equation (4). By combining the iceberg effect with the cultural effects, we hypothesize that neither

the iceberg model nor the traditional gravity model is sufficient to explain the value of movie exports. This is the rationale for conflating the two models into one.

The multiplicative market size imposes the constraint that trade between countries of equal wealth will be greater than trade between a poor and a rich country, a restriction applicable to motion picture trade. Shipments remain inversely related to distance, and will be more or less important when b is greater than or less than one. This gravity-iceberg model suggests that the volume of exports is related to domestic and foreign market sizes combined as well as cultural distances, including trade barriers. Not only is the market larger, the greater is per capita income, but the market wealth effect is multiplicative, suggesting the potential for economies of scale in distribution. The cultural effects are also multiplicative. All things considered, this model is suggestive of the imperfect competition characterizing the motion picture industries.

V. EMPIRICAL MODELS OF CULTURAL DISTANCE

A complex gravity-iceberg model and a unique pooled data set can be used to estimate U.S. motion picture exports and protectionism between other countries and the United States. As it turns out, we lose very little information in going from the particular to the general. In an apparent paradox, prior empirical gravity models suggest that both great distances and close proximity can diminish trade. McCallum (1995), Engel and Rogers (1994), and Helliwell's (1995) gravity models reveal a surprisingly large effect of the contiguity of the Canada-U.S. border in diminishing trade. Then, Anderson and Smith (1996), using a more consistent data set, find significant border effects but substantially less than those found by earlier authors. Characteristically, however, these gravity-trade studies have been conducted at high levels of aggregation—at national or regional aggregate trade amounts. Still, if border effects are important for more generic product manufacturers, they probably matter even more for cultural products. Frankel et al. (1998), as well as Frankel and Wei (1998), as examples, introduce common language as a cultural variable, we deploy still more cultural variables.

The Estimating Equations

For computational ease and for conformity with the literature, our theoretical export equation is rewritten in log transform. Thus, equation (4) becomes

$$(5) \quad \ln X_{ij} = \ln a_{ij} + k \ln G_{ij} + \sum_{m=1}^M -t_{ijm} D_{ijm} + \xi_{ij},$$

where $\ln G_{ij} = [(\ln Y_i + \ln Y_j) - b \ln D_{ij}]$ and a_{ij} is a constant replacing x_{ij} in equations (3) and (4). Although x_{ij} cannot be directly estimated, it clearly becomes the constant term in the log transformation. The last term in equation (5) is an error term with a distribution to be determined statistically.

According to the theory of endogenous protectionism, higher levels of import penetration lead to greater protection because lobbying activities by domestic interest groups intensify in response to increases in import competition. In the motion pictures industry, where cultural sovereignty is a sensitive issue, the theory of endogenous protectionism seems particularly plausible. Our microdata on trade barriers as well as our indices by country (*TBN* and *TBI*) suggest the presence of endogenous protectionism. The use of subsidies (usually funded by levies) appears to be a direct way of maintaining or even growing a local industry in the face of rising imports of American films. Such culturally motivated trade restrictions become an econometric issue, especially because some empirical tests of international trade flows and trade restrictions based on cross-sectional data have found that such flows and barriers are endogenously determined (e.g., Ray 1981a,b; Trefler 1993; Grossman and Helpman 1994; Lee and Swagel 1997; Gawande and Banyopadhyay 2000).

To deal with the simultaneity problem of industry production growth alongside growing protectionism, the instrumental variable method is used to obtain consistent and efficient estimates of the export parameters. We sought variables that would be correlated with the trade barriers but not with the error terms in the export functions. Based on the importance of both the relative size of the import-competing industry and the cultural sovereignty dynamic in the motion pictures

industry, we posit a trade barriers function for country j as it faces imports from country i ,

$$(6) \quad T_{ij} = F(\mathbf{Z}_j, \mathbf{C}_{ij}),$$

where T_{ij} represents trade barriers that indexed can take on the value of *TBN* or *TBI* and \mathbf{Z}_j is a vector of measures of the importance of the industry to the economy of the importing country j . We use *NFP* and *INVR* as direct measures within \mathbf{Z} . The second vector, \mathbf{C}_{ij} , contains country-specific, time-invariant variables measuring various cultural categorizing variables also present in the export functions. The more important the elements of \mathbf{Z}_j , the greater will be the probable lobbying activities by the interests of the import-competing domestic movie industry as imports rise. These elements determine T , but are not determined by it, and do not determine trade, other than through T . Estimates of equation (6) will be used to create the instrumental variables.

Data Base

Our estimates are from a pooled data set of annual time-series and cross-sectional observations (see Appendix for data sources). This set yields 165 observations for 33 countries for 1991–95 so that, in the estimates, $j = 1, \dots, 33$ countries and $i = \text{U.S.}$ ⁵ We use common acronyms for the independent variables in Table 3. In our sample the mean number of films produced annually in other countries is only about 75 compared with 435 in the United States, spotlighting American dominance.⁶ The high standard deviation of *NFP* reflects how a small number of U.S. trading partners in the industry (India, Japan, Hong Kong, China, France, and the Philippines) produce a large share of “foreign” films, whereas most others produce relatively small numbers. In our defined regions in Table 1 Asia dominates foreign production with an annual average of 162 films. The ratio of investment in the motion pictures industry to GDP (*INVR*) reflects the same reality. During

5. U.S. rental revenues from the sample countries as shares of world U.S. film exports, 1991–95, are 96%, 95%, 95%, 97%, and 96%, respectively. The share of U.S. payments for the imports of films from the sample countries as a fraction of total U.S. payments for its film imports for the same years are 97%, 94%, 96%, 90%, and 98%, respectively (*Survey of Current Business*, September 1995 and October 1997).

6. A different source suggests an even greater disparity (*Screen Digest* September 1998).

the sample period for the United States, *INVR* is 0.00091 or six times larger than the mean for the other countries in the sample (*Screen Digest* May 1997).

Traditional measures of spatial distance between countries, such as air distance between cities and adjacency, as well as various measures of cultural distance are considered. Uniquely, air distance (*DIS*) from the United States and adjacency to the United States (*ADJ*) are used both as measures of spatial distance and as naive proxies for cultural distance. Only Mexico and Canada, or 6% of the countries in the sample, however, are considered adjacent to the United States. Whereas education, religion, and language may in part define a culture, U.S. cultural influence may also be defined by geography or spatial proximity that facilitates interactions between Americans and others.

The exact number of cultural variables (*M*) depends on the model specification. We selected three direct measures of cultural distance from the United States, which are literacy rates in other countries (*ED*), the percentages of people who are of Judeo-Christianity faith (*REL*), and the percentages of populations who speak English (*LAN*). A dummy variable (*LDC*) is used to capture any remaining differences between LDCs and developed countries. Although more than half of the countries in the sample are LDCs, the bulk of U.S. motion picture trade is with highly industrialized nations. The mean literacy rate in the entire sample is 90.78%, the population that is Judeo-Christian 63.46% (the standard deviation exceeding the *REL* mean), whereas the mean percentage of English-language speaking population in the importing countries is only 14.33%.

Statistical Techniques

As noted, we generate two instrumental variables. Because the first measure of trade barriers (*TBN*) is a *count* of the number of trade restrictions imposed on imports of motion pictures, the Poisson distribution is a reasonable description for these data (Hausman et al. 1984; Greene 2000). The index of the complexity of trade barriers (*TBI*), on the other hand, is both a discrete as well as a categorical variable. If the error term is normally distributed, ordered probit is the appropriate estimation model. Otherwise, an ordered logit

in which the tails of the distribution of the error term are heavier is the correct model (Greene 2000). The sample quantiles for the *TBN* and *TBI* models (not reported here) reveal small deviations for the residuals of *TBN* but a greater departure from normality of the residuals for *TBI*. Moreover, although the residuals from the *TBN* model appear to be normally distributed, the distribution of the residuals from the *TBI* model has a rather heavy tail.⁷

We conclude that Poisson is the proper choice for the *TBN* model and that the logit model is appropriate for *TBI*. However, in an initial trial we had difficulty running the logit model, and it was abandoned for ordered probit. Maddala (1983) argues that because of similarity between the cumulative normal distribution and the logistic distribution, except at the tails, the results from the logit and probit models are likely to be similar for relatively small samples. Of course, the estimated coefficients from these two alternative models are not directly comparable, and conversions are needed. Thus, Poisson and ordered probit models for the *TBN* and the *TBI* functions, respectively, are estimated, using the maximum likelihood technique.⁸

Another facet to consider in selecting a statistical technique is the nature of the sample: in this case, a balanced panel of 33 countries for five years. In pooling the data, we assume homogeneity in the parameters across all countries. Although the homogeneity assumption underlying pool models has been questioned, Baltagi and et al. (2000), in their estimates of cigarette demand among 46 American states, argue that efficiency gains from pooling is likely to outweigh the bias due to cross-sectional heterogeneity. Baltagi and colleagues contend that their assessment is particularly applicable for short time series. Finally, Maddala (1987) shows that in limited dependent variable models using panel data in which

7. Skewness and kurtosis statistics turn out to be 0.14 and 2.86, respectively, for the *TBN* function and 1.85 and 4.95 for the *TBI* function. A data series is considered to approximate the normal distribution if the value of skewness and kurtosis are close to zero and three, respectively.

8. In the estimation of limited dependent variable models, such as Poisson and ordered probit, of course, log likelihood is usually used as a measure of overall fitness of the model. Although R^2 is reported for Poisson models in LIMDEP, this statistic is not reported for probit models.

the number of cross-sectional units is large and the number of time series is short, a fixed effects model gives inconsistent parameter estimates. Because this aptly describes our pooled sample, we use a *random* effects model by assuming that individual specific constant terms are randomly distributed across countries.

The strategies revealed by the microdata suggest endogenous protectionism. Thus, as we proceed to estimate the export functions, we first need to determine *statistically* whether the trade barriers are endogenous. For this reason, a version of the Hausman specification test is deployed in a simple two-stage procedure (Pindyck and Rubinfeld 1997). First, *TBN* and *TBI* are regressed against all other dependent variables. Then the residuals from these regressions are used as explanatory variables in the estimation of U.S. exports. The null hypothesis for the lack of endogeneity is that the coefficient of the residual is statistically insignificant. The *t*-test results support our microdata findings that the trade barriers are indeed endogenous.

Following Ray's initiative (1981a), a two-stage method is used to estimate the coefficients of the structural equations. First, equation (6) is estimated with *TBN* and *TBI* as alternative dependent variables. Second, the predicted values of the trade barriers functions are used as instrumental variables in the export function estimate or equation (5).

VI. RESULTS

Expected Signs

If the theory of endogenous protectionism prevails, the expected signs for the coefficients of the explicit cultural variables (*ED*, *LAN*, and *REL*) in the trade barriers models are *negative* because an *increase* in their values would diminish the demand for protectionism. The expected sign of the coefficient for *ADJ* is positive if Canada and Mexico have a greater fear of losing their cultural sovereignty through importation of U.S. films than non-adjacent countries. If so, the gravity-iceberg model embodies a degree of apparent contradiction: Distance matters, but so does immediate proximity.

In the U.S. export equations, the expected sign of the coefficient of *G* is positive as long as transportation costs or distance as a proxy for cultural distance does not outweigh the positive influence of purchasing powers in the

countries.⁹ As noted, we do not expect spatial distance or transport costs to deter movies trade. The expected sign of the coefficient of *ADJ* is indeterminate because U.S. export success depends on a tension between the desires for relatively higher trade barriers in Canada or Mexico and their citizens' preferences for American movies (i.e., American popular culture). Because actual or feared import levels motivate trade barriers, the measures of trade barriers (*TBN* and *TBI*) or their predicted values would be positively correlated with U.S. exports. Finally, because *LDC* is a broad measure of cultural differences between the United States and its trading partners, and fewer cultural similarities and thereby taste similarities exist between the United States and the LDCs compared to the United States and other industrialized countries, the expected sign of the coefficient for *LDC* is negative. The expected sign of the constant term that represents x_{ij} is negative because of the melt-down effect.

Endogeneity in the Trade Barriers Equation Estimates

The maximum likelihood estimates of the trade barriers equations are reported in Table 4. Both the Poisson model (for *TBN*) and the ordered probit model (for *TBI*) are corrected for heteroscedasticity. The estimations are generally consistent with the hypothesis that both specific cultural variables and proximity affect the degrees of protectionism. The coefficients of the cultural variables are statistically highly significant with the expected negative signs, except for the coefficient of *REL*. The unexpectedly positive sign for religion may be the result of the large shares of Judeo-Christian population among the industrialized importers compared to those shares in the LDCs. The positive sign of the coefficient for *ADJ* suggests that adjacent nations are more protective of their domestic movie industry. Those nations (Canada and Mexico), as noted, are also dominant users of quantitative restrictions and have the highest average values for *TBN* and *TBI* in Table 1. These high index values are also disproportionate to the number

9. The expected sign would be negative, however, if larger domestic markets in the other nations allow their domestic producers sufficient economies of scale to effectively compete with the U.S. film industry.

TABLE 4
Random Effects Estimates of Trade Barriers Models

| Variables | Expected Sign | Coefficients ^d | | | | | |
|----------------|---------------|--|----------------------------------|-------------------------------------|---|----------------------------------|-------------------------------------|
| | | Equation (6) Poisson Model for <i>TBN</i> | | | Equation (6) Ordered Probit Model for <i>TBI</i> | | |
| | | | | | | | |
| <i>INVR</i> | (+) | 221.9222 (306.8140) | | 408.2013 ^c (269.5697) | 866.2376 ^c (584.6599) | | 928.0070 ^b (455.0643) |
| <i>NFP</i> | (+) | 0.0006 ^c (0.0004) | 0.0007 ^b (0.0004) | | 0.0002 (0.0016) | 0.0007 (0.0012) | |
| <i>ADJ</i> | (+) | 0.4393 ^c (0.1739) | 0.4210 ^a (0.171) | 0.4445 ^a (0.1735) | 1.9832 ^a (0.3670) | 1.8837 ^a (0.3699) | 1.9895 ^a (0.3628) |
| <i>ED</i> | (-) | -0.0082 ^c (0.0062) | -0.0063 (0.0056) | -0.0132 ^a (0.0050) | -0.04182 ^a (0.0160) | -0.0336 ^a (0.0122) | -0.0433 ^a (0.0161) |
| <i>LAN</i> | (-) | -0.0097 ^a (0.0022) | -0.0094 ^a (0.0021) | -0.0102 ^a (0.0021) | -0.0286 ^a (0.0045) | -0.0273 ^a (0.0044) | -0.0288 ^a (0.0045) |
| <i>REL</i> | (-) | 0.0051 ^a (0.0014) | 0.0050 ^a (0.0014) | 0.0051 ^a (0.0014) | 0.0078 ^a (0.0027) | 0.0069 ^a (0.0025) | 0.0078 ^a (0.0028) |
| Constant | | 1.4415 ^a (0.5354) | 1.3004 ^a (0.50044) | 1.9137 ^a (0.4026) | 4.8425 ^a (1.3444) | 4.2235 ^a (1.0845) | 4.9899 ^a (1.3576) |
| Log likelihood | | -261.93 | -262.18 | -262.87 | -305.35 | -306.72 | -305.38 |

^{a(b,c)}Significant at the 1% (5%, 10%) level.

^dEstimated asymptotic standard errors are in parentheses.

of films produced annually in each country (31). Proximity seems to breed contempt.

To explore further the more precise individual effects of *NFR* and *INVR* on trade barriers, one of the two variables is dropped in alternative model specifications.¹⁰ The likelihood ratio, as a measure of overall fitness of the models, remains virtually constant as one of the two variables is dropped, suggesting that the marginal contribution of each variable in the presence of the other is small. However, the size of the coefficient of either *NFP* or *INVR* increases in the absence of the other variable in the model. The coefficient of number of films (*NFP*) in the *TBN* function is statistically significant with the expected positive sign, but investment in the industry (*INVR*) appears not to be enhancing trade barriers.¹¹ As noted earlier, subsidies usually financed through video levies characterize protectionism in

10. Because of concern about possible correlation between the measures of the importance of the motion pictures industry to the domestic economy, the zero-order correlation coefficients for *INVR* and *NFP* are considered; a coefficient of 0.31 suggests that imperfect multicollinearity is not a serious problem. Then, R^2 from the auxiliary equations for *NFP* and *INVR* are used to calculate the *VIF*; the value of 1.72 for *NFP* and 1.21 for *INVR* suggest that perfect multicollinearity does not seem to be an issue either.

11. The coefficients of *NFP* and *INVR* in the *TBN* and the *TBI* equations have varying degrees of statistical significance with the correct signs (see Table 4).

those European countries aspiring to a strong domestic movie presence. Canada, another aspirant, has subsidies sans levies. Thus, the microdata results suggesting that trade barriers are raised to protect the interests of the cultural import-competing industry (or the culture itself) gain considerable support in the functions used to estimate the instrumental variables.

We proceed to use the predicted values of the trade barriers indices from the base models in the estimation of the U.S. export function. Although we hypothesize that the cultural identity variables also belong in the export function, the inclusion of these variables in the presence of the instrumental trade barriers variables may cause a multicollinearity problem. To test for such multicollinearity, the variance inflation factor (*VIF*) is estimated for predicted values of *TBN* against all other explanatory variables in the original export function. The value of *VIF* does not exceed 0.33 in any of the estimates. Connecting the trade pattern in motion pictures to the cultural identity of countries could be informative, so we retain the cultural identity variables in the export model.

Estimates for the U.S. Export Models

The heteroscedasticity-corrected estimates of equation (5) for U.S. exports of motion

TABLE 5
Random Effects Regression Results for $\ln X^c$ in Gravity-Iceberg Model

| Variables | Expected Sign | Coefficients ^d | | | |
|-------------------|---------------|-----------------------------------|-----------------------------------|----------------------------------|----------------------------------|
| | | Equation (5) Model I | Equation (5) Model II | Equation (5) Model III | Equation (5) Model IV |
| $\ln G$ | (+) | 0.0925 (0.0769) | 0.1081 ^c (0.1258) | 0.1887 ^b (0.1044) | 0.1831 ^b (0.1065) |
| TBI (predicted) | (+) | | 0.2168 ^a (0.0489) | | 0.1246 ^a (0.0430) |
| TBN (predicted) | (+) | 0.6469 ^a (0.2465) | | 0.3641 ^a (0.1040) | |
| ADJ | (+ or -) | 0.0751 (0.3349) | 0.1082 (0.2714) | | |
| ED | (+) | 0.0857 ^a (0.0112) | 0.0876 ^a (0.0099) | | |
| LAN | (+) | 0.0083 ^c (0.0065) | 0.0052 (0.0044) | | |
| REL | (+) | -0.0047 (0.0040) | -0.0007 (0.0024) | | |
| LDC | (-) | -1.1330 ^a (0.2313) | -1.0584 ^a (0.2146) | -1.969 ^a (0.2987) | -2.0916 ^a (0.3178) |
| Constant | (-) | -10.8203 ^a (1.3130) | -10.3131 ^a (0.9510) | -2.5305 ^a (0.6228) | -1.8689 ^a (0.6958) |
| Adj. R^2 | | 0.66 | 0.68 | 0.51 | 0.51 |
| F | | 46.88 | 51.51 | 57.75 | 57.30 |

^{a(b,c)}Significant at the 1% (5%, 10%) level.

^dStandard errors are in parentheses.

^eHeteroscedasticity corrected estimates.

pictures appear in Table 5. The Roman numerals represent successively different specifications of the initial model. In the estimate of gravity-iceberg model I, the log of G loses its statistical significance in the presence of LDC and specific cultural variables. Although the sizes of the cultural variable coefficients are only slightly altered, language (LAN) has diminished statistical significance. The coefficients of the predicted value of TBN are positive and statistically highly significant in models I and II. The numerical index TBN is replaced with TBI in models II and IV. The two sets of results are similar except for the insignificance of the coefficient of language (LAN) in model II and the significance of the coefficient of ADJ in model II. Protectionism abroad appears to rise with U.S. exports. As expected, the constant term representing x_{ij} is negative, and reflects the iceberg meltdown effect. Also, as expected, gravity (G) and LDC have stronger showings in the gravity-iceberg models when specific cultural variables are dropped (models III and IV). Still, by statistical standards—the

adjusted R^2 , the value of F , or the degrees of significance and correct signs of variables—the gravity-iceberg export models that include specific cultural variables perform best.¹²

Taken together, the estimates corroborate the strategies revealed in the microdata, namely, that particular countries desire to develop local industry and that the cultural threat of proximity of the United States to Canada and Mexico is mostly expressed through protectionism. Once the protectionist instrumental variables are introduced in the export models, ADJ becomes insignificant. The sizes of all of the cultural variable coefficients are surprisingly similar across the trade barriers estimates. Still, in our preferred complex gravity-iceberg export estimates wherein *endogenous* protection flows through

12. Zero-order correlation matrices and VIF estimates are used to test all of the export models for multicollinearity. The zero-order correlation coefficients are fairly low, the highest being between LDC and $\ln(Y_i + Y_j)$ at 0.56. Furthermore, there is no indication of multicollinearity based on the values of the VIF.

the predicted values of *TBI* and *TBN* (export models I and II), some of the cultural variables remain significant and important alongside the state of economic development. Consumer preferences for American films are strong, but so is antitrade lobbying interests leading to levies and subsidies. There remains a tension between foreign consumers who desire American movies and foreign movie producers who have a special interest in slowing American movie imports.

VII. CONCLUDING REMARKS

The strategies of protectionism revealed by the microdata are consistent with our econometrics. The gravity-iceberg export models perform well even with aggregated indices combined with standard gravity measures of purchasing power and spatial distance. Explicit cultural variables (such as language, education, and religion) also are important indirect (via protectionism) influences on U.S. motion picture exports. Microdata as well as econometric estimates have trade barriers responding positively to growing U.S. exports as well as to aspirations for a thriving local industry buoyed by levies and subsidies, barriers that are determined endogenously. Moreover, the use of subsidies appears to be mostly a reaction to rising U.S. exports.

The United States continues to dominate the world as a popular cultural center through its export of films. Despite substantial barriers to film imports, other large economies apparently have been unable to internationally extend their domestic markets. Even India, where subsidies support the producer of the largest number of films in the world, has not successfully exported films to the U.S. market. Despite subsidies to their film industries, smaller economies have been unable to gain a competitive advantage in international markets. Europe and industrialized countries in other regions nonetheless are major consumers of American films.

Even though the English-speaking population in our sample of foreign countries is small, any increase in the use of the English language enhances U.S. exports. The absence of English speech, however, apparently deters consumption of foreign films in the American market. Presumably, even *dubbed* American films outperform the competition in the world market. This speaks volumes regarding the

popularity of American films abroad even as it certifies the advantage that domestic purchasing power gives to early success and economies of scale in distribution for American film producers. The greatest U.S. barrier to foreign competition and effective foreign protectionism appears to be the gigantic production and marketing costs required to produce the kinds of films now demanded around the world. The global distributional reach of the American movie industry and the popularity of its films are formidable.

Does the recent experience of the motion picture industry provide any lessons on trade policies in the United States or other countries? Elimination of earlier American barriers to motion pictures was an efficient act because they were unnecessary in the face of weak preferences for foreign films. The U.S. music recording industry has replicated the export success of motion pictures for about the same reasons. The strategy of levies-subsidization by aspiring countries gives local producers a cultural buffer even though it does little to generate exports or to limit imports from the United States. Other industries have been able to use brand image as a way of duplicating the trademark quality of American film stars. BMW, like Mercedes Benz, has a star quality that has eluded the American big three. Chrysler's response may ultimately be effective—merger with Daimler, though it might tarnish the Mercedes as a star. Ultimately, economies of scale and highly effective product differentiation eclipse traditional protectionism, if only for distinctive products produced in economies or regions that are large or wealthy.

APPENDIX: DATA SOURCES

The data used in Figures 1 and 2 on domestic box office as well as production and advertising costs of the major studios is from the Web site of the MPAA. The data in Figure 1 on international revenues are from various January issues of *Variety*. International trade figures in motion pictures are from the *Survey of Current Business*, October 1997 and September 1995, U.S. Department of Commerce. GDP data are from the *U.N. Statistical Yearbook*, 1995. Because the United Nations does not report GDP figures for Taiwan, *Europa World Yearbook*, published by Europa Publications, 1994-98, is used as an alternative source. Figures for air distance between the closest major U.S. city and the capital of each country are from *World Almanac* 1996, published by Funk and Wagnalls, New York. Population data is extracted from *International Financial Statistics*, September 1993 through September 1997, International Monetary Fund. Literacy

rates are from various sources, including *UNESCO Statistical Yearbook*, 1994–96; *Human Development Report*, 1995–96; and *World Development Report*, 1995, all published by the United Nations, as well as *Europa World Yearbook*, 1994–97. Data for religion and language are from *The Statesman's Yearbook*, 1994–97, published by St. Martin's Press. LDC identification is based on the United Nations classification in *Human Development Report*, 1998. Data for number of films produced and amount of investment in the industry for each country is from *Screen Digest* (May 1997). Number of films and investment data for some countries, for one or more years of 1991–95, are not reported in *Screen Digest*. These are typically small LDCs in which the industry is not very active; therefore, we have used the average for 1991–95 for each of these countries.

Detailed quantitative and qualitative information on trade barriers is collected from annual MPAA reports titled *Trade Barriers to Exports of U.S. Film Entertainment*, 1991–96. The countries in our sample include Argentina, Australia, Belgium-Luxembourg, Bermuda, Brazil, Canada, Chile, China, France, Germany, Hong Kong, India, Indonesia, Israel, Italy, Japan, Malaysia, Mexico, the Netherlands, New Zealand, Norway, the Philippines, Republic of Korea, Saudi Arabia, Singapore, South Africa, Spain, Sweden, Switzerland, Taiwan, Thailand, United Kingdom, and Venezuela. Although the choice of countries is based on the availability of trade data, the selected sample accounts for at least 90% and as much as 98% of U.S. motion picture rental revenue from exports and foreign country revenue from the United States during each year of our sample (see note 5).

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