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National Self-Sufficiency in Broadcast Television Programming: Examining the Airtime Shares of Homemade versus U.S.-Made Programs

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Building on economic and cultural theories about transnational media flow, this study investigates individual countries' self-sufficiency in broadcast television programming. It traces and predicts the airtime shares of domestic and American programs, using longitudinal data taken at decade-long intervals during 1962–2001 for 20 countries or territories worldwide. Regression analysis reveals that the airtime share of homemade programs is an increasing function of the size and affluence of that country's domestic audience. That of American shows is, in contrast, negatively related to not only the same economic descriptors, but also the cultural distance of that country from the U.S.

The transnational flow of audiovisual media products has received a wealth of scholarly attention and has been examined from various perspectives. Two of the perspectives, namely the economic model of international media trade and the theory of cultural discount, stand out to be potent explanations. The former suggests that a media industry's export in an overseas market is positively linked to the economic fundamentals of its domestic market (Hoskins, McFadyen, & Finn, 1997; Hoskins & Mirus, 1988; McPhail, 2006; Waterman, 1988; Wildman & Siwek, 1988). The latter stresses local recipients naturally prefer products from indigenous or familiar cultures, causing a reduction to the appeal of imported content products (Cantor & Cantor, 1986; Hoskins & Mirus, 1988; Straubhaar, 1991; Waterman, 1988).

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DOI: 10.1080/08838151.2013.845830

Journal of Broadcasting & Electronic Media 57(4), 2013, pp. 543–561
ISSN: 0883-8151 print/1550-6878 online

A significant body of research has investigated the transnational flow of media content products, especially movies (e.g., Fu, 2006; Fu & Sim, 2010; Jayakar & Waterman, 2000; Lee, 2006; Waterman & Jayakar, 2000). Several studies have traced and explained the cross-border traffic of *television* programs over countries or territories (Nordenstreng & Varis, 1974; Straubhaar, 2007), but they have not applied economic models to explain television flows. This study applies economic theories to Straubhaar's (2007) data, which had previously applied perspectives based on audience attraction to cultural proximity (Straubhaar, 1991).

There are differences between movies and television programs, which may lead to differences between the economic and cultural dynamics of television program broadcasting and that of movie showing. First of all, the television industry is more local oriented than the movie industry. Almost every country has its own television program production and broadcast system, which operates under state regulation and oversight (Bielby & Harrington, 2008). Governments play a more important role in regulating the content and trade of television programming than that of movies (Wildman & Siwek, 1988).

Second, movies are consumed within a few hours, whereas television series can run for years. Due to the prolonged life of television programs, audiences have sufficient time to get familiar with the contexts of the programs, which may work to moderate any unfamiliarity between the domestic audience and the foreign programs. Iwabuchi (2002) noted that audience reception of audiovisual products changes over time, such as the growth of the exports of Japanese dramas and animations to other Asian markets and Western countries in the 1990s.

Third, audience members' viewing behaviors of movies are different from that of television programs. Cinema-going had historically been a luxury to many people. Motion Picture Association of America (2012) showed that around 33% of Americans and Canadians never went to cinema throughout a year. However, television viewing has been more connected to people's daily lives. Watching television programs has been the major and even dominant leisure activity for Americans, accounting for about half of everyday leisure time (Bureau of Labor Statistics, 2011; Kubey & Csikszentmihalyi, 1990). Indeed, the connection of television to daily life is seen to be a factor that propels programming toward great connection to the national or local experience of daily life (Dickason, 2010; Straubhaar, 1991, 2007; Vukanovich, 2002). In this sense, the international flow of television programs is an important subject in its own right. Do the economic model of international media trade and the theory of cultural discount hold in the context of television program broadcasting? If so, what are the magnitudes of the effects on the television program airing of the economic and cultural factors? These questions can be better answered by an empirical examination of television flow data.

Accordingly, this study aims to uncover the nature and pattern of transnational television program flows, using a large globe sample. Particularly, this study will look at the self-sufficiency in broadcast television programming by a number of individual nations or territories. National self-sufficiency in broadcast television programming refers to a country's independent ability to produce and broadcast

domestic programs. It represents the position with regard to national preservation of the domestic cultural industry and resistance to foreign television programs. McNeely and Soysal (1989) stated that in many nations, governments aim for self-sufficiency in producing and broadcasting domestic programs, in order to protect cultural identity. Previous research has traced the competitiveness of domestic television program production in a specific country, for instance, South Korea (Lee, 2007), which reflects the country's national self-sufficiency. However, to the best of our knowledge, no research has quantitatively examined the determinants for countries' self-sufficiency in television programming using global data.

To bridge the research gap, this study analyzes the economic and cultural influences on countries' self-sufficiency in television programming, which serves to explain how a country develops its own television industry and resists cultural penetration. The effects of the domestic market scale and the cultural distance from the U.S. on the airtime shares of homemade versus U.S.-made television programs in individual countries will be examined. This examination demonstrates the economic and cultural influences on countries' self-sufficiency in broadcast television programming.

The Economic Model of International Media Trade

The economic model of the international media trade suggests a home market effect—countries with larger and wealthier domestic markets tend to produce more movies or television programs with higher quality, and thus account for a larger proportion of export in the international trade (Hoskins et al., 1997; Hoskins & Mirus, 1988; McPhail, 2006; Waterman, 1988; Wildman & Siwek, 1988). Media products are considered public goods, that is, the contents are jointly consumed by all of its audience members. Therefore, the number and the spending power of audience members determine the potential revenue of the product, and thus impact the level of investment when maximizing the profit. Other things being equal, producers from a large market tend to make media products of higher budget than those from a small market. Higher production budget leads to greater quality of the media products, which will attract more audience members. When exported, such content products of higher quality or consumption value will be more appealing to foreign audience members, as compared to its competitors. The high overseas sales in turn influence producers' investment decisions and further increase the level of investment on product quality (Owen & Wildman, 1992). In this sense, the home market with a larger and wealthier audience base has a competitive advantage in the international trade of media products.

A significant body of research has empirically examined the international flow of movies (Fu & Lee, 2008; Jayakar & Waterman, 2000; Lee, 2002; Lee & Bae, 2004; Oh, 2001; Waterman & Jayakar, 2000) and television programs (Dupagne & Waterman, 1998; Varis, 1984, 1986; Waterman & Rogers, 1994). These studies found that the export share of a country's audiovisual products to a given market is

positively associated with the strength of its general domestic economy measured by GDP, or the development of its domestic media industry measured by the box office revenue, theatre attendance, etc. These findings are consistent with the economic model of media trade.

The Cultural Discount in International Media Trade

As media contents are cultural products which convey specific ideas, beliefs, and values of the producing market, cultural factors play an important role in explaining the worldwide consumption of audiovisual content products. Straubhaar (1991) articulated that media content consumers actively pursue cultural proximity, that is, they prefer domestic cultural products or products from familiar cultures. As such, the cultural difference between the production origin and the target foreign market will result in cultural discount, that is, a decline of the value of the content product to the foreign audience (Cantor & Cantor, 1986; Hoskins & Mirus, 1988; Waterman, 1988). The larger the cultural distance from the originating market to the consuming market, the greater the value reduction of the product.

Scholars have empirically examined the effect of cultural discount on the consumption of movies (Fu & Lee, 2008; Fu & Sim, 2010; Lee, 2006; Oh, 2001) and television programs (McFadyen, Hoskins, & Finn, 2003). These studies found that when media products are exported overseas, their export prices or box office performances are negatively associated with the cultural distance between the importing and exporting markets, suggesting the cultural discount effect.

The above studies identified the impact of market size or cultural distance on the international trade of media products. Particularly, empirical research has explored the factors influencing the self-sufficiency of media products. Oh (2001) defined the self-sufficiency ratio as the proportion of domestic movies' revenues in the gross box office revenues of a given country, and found that a country's cinema market scale and its cultural distance from the U.S. impact the self-sufficiency ratio positively. In addition, Lee and Bae (2004) suggested that the level of investment to the domestic film industry is positively associated with the self-sufficiency ratio. These investigations provided empirical evidence regarding the economic and cultural influences on the self-sufficiency of the movie industry. Nonetheless, very few studies have empirically examined the impacts of cultural and economic factors on the international flow of television programs. One notable exception is the work by McFadyen et al. (2003), but their research analyzed the factors determining the prices of television programs rather than the self-sufficiency.

Hypotheses

According to the economic model of media trade, the airing of homemade television programs should be positively associated with the scale of the domestic

market. A larger and stronger domestic television industry would produce more programs and/or programs of higher quality, and thus are better able to attract domestic audience and, in turn, sustain a higher level of domestic programming. Note that the home-market scale is measured by both the size and affluence of the audience base in the country. Therefore, we propose the hypotheses:

H_{1a}: The share of broadcast time occupied by *domestic* programs is positively related to the size of the national television audience base of a country.
H_{1b}: The share of broadcast time occupied by *domestic* programs is positively related to the affluence of the country.

Next, this study examines the broadcasting of U.S. television programs in individual countries. According to the media trade theory, the airtime share of U.S. television programs in a given country is expected to be influenced by the scale of the domestic market. The larger the market scale of a country, the stronger ability the country has to produce domestic programs, and thus the less the country relies on U.S. products as a programming source. Therefore, we postulate H_{2a} and H_{2b}:

H_{2a}: The share of broadcast time occupied by *American* programs is negatively related to the size of the national television audience base.
H_{2b}: The share of broadcast time occupied by *American* programs is negatively related to the affluence of the country.

We also consider the influence of cultural distance on the airtime shares of U.S.-made television programs. The cultural discount theory would predict that the cultural distance between the exporting and importing markets should inhibit the broadcasting of the former's programs in the latter. In the case of U.S.-made programs, such products would be of a lesser value to a national society whose culture is more distant from that of the U.S. Hence, we postulate:

H_3: The share of broadcast time occupied by *American* programs is negatively related to the cultural distance between the U.S. and the country under study.

Data and Method

Dependent Variables

The data on the supply of television programs are drawn from Straubhaar's book (2007), in which an appendix provides airtime shares of domestic and American programs for specific production origins. The programming-time compilation ob-

serves 22 countries or territories[1] in the years of 1962, 1972, 1982, 1991, and 2001, which are roughly in decade-long intervals. The country sample covers certain major cultural geographies around the world, as per Straubhaar's sampling purpose. However, we exclude China and India from this study because the countries' broadcast sectors are heavily controlled especially regarding exhibition of foreign content. As a result, 20 countries remain in the dataset used by this study.

Based on longitudinal national reports, Straubhaar (2007) tabulates the percentages of a given country's terrestrial television broadcast time during all day and prime time (i.e., the hours from 7 to 11 p.m.), that are claimed by programs of distinct origins. The current study examines the airtime shares of domestic-made and U.S.-made programs in particular. First, the variable $HomeShareforAD_{cy}$ denotes the share in the all-day (*AD*) airtime occupied by home-produced programs in country *c* in year *y*; $HomeShareforPT_{cy}$ is the prime-time (*PT*) counterpart.

Likewise, the variables $USShareforAD_{cy}$ and $USShareforPT_{cy}$ denote the corresponding measures for American programs. These four measures are hypothesized to be dependent on the aspects as follows.

Independent Variables

Market Scale.

In this study, we measure the scale of a domestic market by per-capita GDP and the number of television sets in the country or territory. The former proxies the wealth of the audience, which supports the infrastructure of the domestic television industry. The latter represents the national demand for television programs. The variable GDP_{cy} records country *c*'s per-capita GDP in US$1,000 of year *y*, standardized in the year 2000 value. The GDP_{cy} data were collected from *World Development Indicators* (World Bank Group, 2011). The data on the television set number in country *c* in year *y*, measured in millions, are collected from *World Telecommunication Indicators Online* (International Telecommunication Union, 2011) and denoted as $AudBase_{cy}$.

Cultural Distance.

We measure the cultural distance between the U.S. and the country under issue. Following Fu and Govindaraju (2010), this between-country cultural distance is quantified using Hofstede's cultural index (1980, 2001). The Hofstede national culture model takes into account four cultural dimensions—uncertainty avoidance, power distance, masculinity, and individualism. This index has been used in a significant number of media flow studies (e.g., Fu & Govindaraju, 2010; Fu & Sim, 2010; Lee & Bae, 2004; Oh, 2001). The variable $CulDist_{c\text{-}US}$ represents the calculated cultural distance between country *c* and the U.S., and is computed

through Kogut and Singh's (1988) formulation using the Hofstede's cultural index:

$$CulDist_{c\text{-}US} = \sum_{d=1}^{4} [(I_{dc} - I_{du})^2/V_d]/4.$$

Here I_{dc} and I_{du} are the cultural indices of country c and U.S., respectively, on each Hofstede's cultural dimension d. The difference between I_{dc} and I_{du} represents the degree of dissimilarity between the two countries in the dimension. V_d refers to the variance of the d indices in Hofstede's country sample. The difference between I_{dc} and I_{du} is standardized by V_d to correct for scale inequality across the four dimensions. The standardized differentials indicate the cultural distance from the country c to the U.S. according to the four dimensions on a common scale. Then the four standardized differentials are averaged to generate $CulDist_{c\text{-}US}$, which represents the overall cultural distance from the U.S. to country c.

Time Trend.

A set of dummy variables indicating the year of the observation are included to control for the temporal variations of the airtime shares in television programs. With the above factors accounted for, the temporal variations should be due to other reasons than the hypotheses. Four year dummies, D_{1972}, D_{1982}, D_{1991}, and D_{2001}, are used to represent the years of observation other than 1962, used as the comparison base.

In summary, the dataset includes 20 countries or territories in the years of 1962, 1972, 1982, 1991, and 2001. Among them, some countries are missing data on airtime shares, per-capita GDP or total number of television sets in some years, which are thus omitted from this study. Table 1 summarizes the basic statistics of the variables for the 1962, 1972, 1982, 1991 and 2001 panel datasets, respectively.

Regression Analysis

This section constructs regression models to test the hypotheses. The program airtime shares are specified to be a function of the factors that have been explicated. We start with explaining the shares of homemade television programs, which are related to the market measures and year dummies as in Eqs. (1) and (2).

$$\text{logit}HomeShareforAD_{cy} = \alpha_0 + \alpha_1 \cdot \log AudBase_{cy} + \alpha_2 \cdot \log GDP_{cy} + \boldsymbol{\alpha_3} \cdot \mathbf{D_y} + \varepsilon, \quad (1)$$

$$\text{logit}HomeShareforPT_{cy} = \beta_0 + \beta_1 \cdot \log AudBase_{cy} + \beta_2 \cdot \log GDP_{cy} + \boldsymbol{\beta_3} \cdot \mathbf{D_y} + \varepsilon. \quad (2)$$

Table 1
Summary Statistics of the Variables for 1962, 1972, 1982, 1991 and 2001

	Year														
	1962			1972			1982			1991			2001		
	n	*M*	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*	*n*	*M*	*SD*
$USShareforAD_{cy}$	12	0.228	0.145	16	0.284	0.168	17	0.242	0.158	17	0.235	0.157	15	0.231	0.121
$USShareforPT_{cy}$	13	0.229	0.156	17	0.237	0.148	18	0.198	0.141	17	0.229	0.177	15	0.237	0.178
$HomeShareforAD_{cy}$	12	0.598	0.276	16	0.545	0.227	17	0.584	0.214	17	0.582	0.233	16	0.623	0.218
$HomeShareforPT_{cy}$	13	0.611	0.276	17	0.585	0.241	18	0.625	0.242	17	0.600	0.273	16	0.651	0.249
$AudBase_{cy}$	1	12.000		17	5.474	9.284	18	10.142	16.312	18	13.400	19.364	15	22.213	27.828
GDP_{cy}	13	4.777	3.487	15	7.921	5.192	17	9.191	6.652	17	11.560	9.317	16	12.777	11.233
$CulDist_{c\text{-}US}$	13	2.160	1.445	17	1.942	1.339	18	2.002	1.324	18	1.921	1.228	17	2.099	1.395

Note. n = the number of cy observations with data available; M = the mean; SD = standard deviation.

Diagnosis of the data shows that the relationship between the dependent variables and explanatory variables is not linear. Therefore, data transformation is required for both the dependent and independent variables in order for the regressions to conform to the basic OLS assumptions and to generate results correctly. First, the variables $AudBase_{cy}$ and GDP_{cy} enter the regression in log form, because their data exhibit excessive variations. The log transformation scales down the variations and thus shuns the problem that extreme observations may unduly influence the regression coefficients.

Moreover, the dependent variables $HomeShareforAD_{cy}$ and $HomeShareforPT_{cy}$ have values which appear to be pressed flat below the upper bound (i.e., 100%) and, as a result, display nonlinearity under the cap. The data situation violates the normality principle. To address this, a logit transformation of the dependent variables is taken when being entered into the regression. This transformation is commonly used to remove the upper and lower limits of the data in order to linearize the relationship between the dependent and the independent variables (Fox, 2008). The equations above indicate these transformations accordingly.

As the regressions are in the log function, the coefficients represent the effect of the explanatory variables on the odds value of the dependent variable in elasticity terms (i.e., the percentage change in the odds value from a 1% change in the explanatory variable). The coefficients (α_1 and β_1) of $AudBase_{cy}$ are anticipated to be positive according to H_{1a}. Similarly, H_{1b} expects the coefficients (α_2 and β_2) of GDP_{cy} to be positive.

Next, we estimate the shares of American programs to be a function of home market scale, cultural distance, and the year variables. Eqs. (3) and (4) express the specification.

$$\text{logit}USShareforAD_{cy} = \gamma_0 + \gamma_1 \cdot \log AudBase_{cy} + \gamma_2 \cdot \log GDP_{cy} + \gamma_3 \cdot \log CulDist_{c\text{-}US} + \boldsymbol{\gamma_4} \cdot \mathbf{D_y} + \varepsilon, \quad (3)$$

$$\text{logit}USShareforPT_{cy} = \omega_0 + \omega_1 \cdot \log AudBase_{cy} + \omega_2 \cdot \log GDP_{cy} + \omega_3 \cdot \log CulDist_{c\text{-}US} + \boldsymbol{\omega_4} \cdot \mathbf{D_y} + \varepsilon. \quad (4)$$

Herein, the distribution of the variables $USShareforAD_{cy}$ and $USShareforPT_{cy}$ shows a nonlinear cluster of observations right above the lower bound (i.e., 0%). For the same reason, they are entered in logit transformation.

The coefficients (γ_1 and ω_1) of $AudBase_{cy}$ should be negative as *H2a* predicts. Likewise, the coefficients (γ_2 and ω_2) of GDP_{cy} are expected to be negative. Last, the coefficients (γ_3 and ω_3) of $CulDist_{c\text{-}US}$ should be negative, as *H3* postulates.

Results

All equations are estimated by OLS regression. Table 2 reports the regressions of homemade programs' airtime shares, which are Equations (1) and (2). It is diagnosed that the log$AudBase_{cy}$ and logGDP_{cy} variables are correlated to a sizable extent (r = .438) and the coefficient of logGDP_{cy} is unstable whether or not log$AudBase_{cy}$ is included in these regressions. This is a typical symptom of the collinearity problem. To redress this problem, logGDP_{cy} and log$AudBase_{cy}$ are entered separately from each other into the regressions, as described below.

First, in Model 1 logit$HomeShareforAD_{cy}$ is regressed over the audience base size and the year dummies. The results show that log$AudBase_{cy}$ has a positive and statistically significant relationship (p = .000) with logit$HomeShareforAD_{cy}$, meaning that a larger national television audience base leads to an increase in the share of all-day airtime of homemade television programs.

Model 2 enters logGDP_{cy} in lieu of log$AudBase_{cy}$ and shows that logGDP_{cy} is also positively related to logit$HomeShareforAD_{cy}$, though the relationship is not statistically significant (p = .757).

Models 3 and 4 are regressions of prime-time shares of homemade programs. Model 3 regresses logit$HomeShareforPT_{cy}$ over the audience base size in addition to the year dummies. In this model, log$AudBase_{cy}$ has a positive coefficient and is statistically significant (p = .001). In Model 4, log$AudBase_{cy}$ is replaced by logGDP_{cy}. The results show that the coefficient of logGDP_{cy} is, again, statistically indistinguishable from zero (p = .331).

Table 2
Economic Influence on Airtime Share of Homemade Programs

	logit$HomeShareforAD_{cy}$				logit$HomeShareforPT_{cy}$			
	Model 1		Model 2		Model 3		Model 4	
Variable	*B*	*t*	*B*	*t*	*B*	*t*	*B*	*t*
Constant	−6.975***	−4.83	0.273	0.25	−6.880***	−3.43	2.040	1.50
log$AudBase_{cy}$	0.386***	5.53			0.359***	3.68		
logGDP_{cy}			0.041	0.31			−0.158	−0.98
D_{1972}	1.727	1.86	−0.400	−0.80	2.214	1.74	−0.188	−0.33
D_{1982}	1.625	1.77	−0.159	−0.33	2.174	1.72	0.095	0.17
D_{1991}	1.458	1.59	−0.306	−0.63	1.904	1.51	−0.183	−0.32
D_{2001}	1.282	1.40	−0.125	−0.25	1.778	1.40	0.172	0.30
R^2	0.353		0.013		0.206		0.025	
N	66		73		67		76	

Note. *p < .05. **p < .01. ***p < .001.

On the whole, log$AudBase_{cy}$ is significant in predicting both $HomeShareforAD_{cy}$ and $HomeShareforPT_{cy}$, which attests to the positive influence of the audience base size of a national television market on the airtime shares of homemade programs. H_{1a} is supported. It can be calculated from the coefficients of log$AudBase_{cy}$ in Model 1 and 3 that when the audience base size ($AudBase_{cy}$) is doubled, it will increase the odds of the airtime shares of homemade programs by around 30% and 28%, respectively in all-day broadcasting time and prime time.

Nonetheless, GDP_{cy} is not a significant predictor for $HomeShareforAD_{cy}$ or $HomeShareforPT_{cy}$. It means that the average wealth of the society does not seem to link to the airtime shares of domestic television programs. H_{1b} does not receive support.

The regressions of the airtime shares of U.S.-made programs are reported in Table 3. In Models 5 and 6, logit$USShareforAD_{cy}$ is regressed over the home-market scale and cultural distance indicators in addition to the year dummies. logGDP_{cy} and log$AudBase_{cy}$ are entered separately from each other into the regressions because of the correlation between the two variables. In model 5, log$AudBase_{cy}$ has a negative relationship with logit$USShareforAD_{cy}$ and is statistically significant ($p = .000$), meaning that an increase in a country's television audience base leads to a decline in the share of all-day airtime of U.S.-made television programs in the country. In Model 6, in which log$AudBase_{cy}$ is replaced by logGDP_{cy}, the results show that logGDP_{cy} has a negative and statistically significant effect on logit$USShareforAD_{cy}$ ($p = .003$). This suggests that an increase in a country's per-capita GDP will reduce the American programs' airtime share in the country.

Table 3
Economic and Cultural Influence on Airtime Share of U.S.-made Programs

	logit$USShareforAD_{cy}$				logit$USShareforPT_{cy}$			
	Model 5		Model 6		Model 7		Model 8	
Variable	*B*	*t*	*B*	*t*	*B*	*t*	*B*	*t*
Constant	2.386	1.89	1.434	1.49	2.220	1.35	−0.173	−0.13
log$AudBase_{cy}$	−0.282***	−4.56			−0.266**	−3.28		
logGDP_{cy}			−0.356**	−3.14			−0.183	−1.14
log$CulDist_{c\text{-}US}$	−0.151*	−2.32	−0.248**	−2.95	−0.200*	−2.37	−0.237*	−2.09
D_{1972}	0.543	0.66	0.533	1.43	0.308	0.29	0.413	0.85
D_{1982}	0.540	0.66	0.351	0.97	0.103	0.10	0.083	0.18
D_{1991}	0.614	0.75	0.395	1.08	0.381	0.36	0.397	0.81
D_{2001}	0.944	1.15	0.449	1.21	0.819	0.77	0.376	0.76
R^2	0.304		0.170		0.220		0.074	
N	65		73		66		76	

Note. *$p < .05$. **$p < .01$. ***$p < .001$.

Models 7 and 8 are regressions of logit$USShareforPT_{cy}$, whose regressors are specified in the same ways as Model 5 and 6. The patterns of the log$AudBase_{cy}$ and logGDP_{cy} results resemble closely what is found with Model 5 and 6 above.

To sum up, the results about $AudBase_{cy}$ indicate a negative effect of the audience size on the airtime share of American programs in an average country. Thus, they respond positively to H_{2a}. The coefficients of log$AudBase_{cy}$ in Model 5 and Model 7 indicate that if the national audience size doubles, the odds of the shares of U.S.-made television programs during all day and prime-time broadcasting will decline by around 18% and 17% respectively.

GDP_{cy} is also statistically significant in explaining U.S.-made programs' airtime shares. Its results mean that a wealthier country tends to exhibit U.S.-made television programs at a lower frequency. In Model 6, the coefficient of logGDP_{cy} suggests that the odds of the share in all-day airtime of U.S.-made programs will drop by about 22% if the country's per-capita GDP is increased by 100%. It is so despite that GDP_{cy} is not statistically significant in predicting $USShareforPT_{cy}$ at 5% level. Still, the results tend to be consistent with *H2b* in general.

$CulDist_{c\text{-}US}$ has a negative and statistically significant coefficient in both Models 5 and 6 ($p = .024$ and .004, respectively). The variable is also found significant and with the same sign in Models 7 and 8. It is suggested that a country that has more a different culture than Americans' will broadcast a lower level of U.S.-made programs than a country that is more culturally similar to the U.S. Therefore, H_3 receives support. The coefficients of log$CulDist_{c\text{-}US}$ in Model 5 and 7 indicate that the odds of the all-day-time and prime-time shares of U.S.-made television programs will decline by around 10% and 13% if the broadcast country's cultural distance from the U.S. is greater by 100%. The results also show that the coefficients of the home-market scale variables are larger than those of the cultural distance variables in these models, suggesting that a country's domestic market scale has a relatively more substantial impact on the import of American programs in the country, as compared to its cultural distance from the U.S.

Now, we review the outcomes about the temporal variables in the airtime share regressions. In Models 1 and 3, though the coefficients for the year dummies are not statistically significant, the results show a fairly steady pattern of decline in the airtime shares of homemade programs. Similarly, in Models 5 and 7, their results display an increasing trend in the airtime shares of U.S.-made programs. These tendencies indicate that domestic broadcasters around the world, by and large, have aired fewer and fewer homemade programs but more and more American programs over the four decades, with the economic and cultural variations already controlled for. In addition, another series of regressions are executed with a variable indicating the number of the year *y* of the observation in lieu of the year dummies. These extra regressions reveal essentially the same picture.

Furthermore, the ratio of the homemade to U.S.-made share during all-day-time and prime-time broadcasting are calculated and denoted as $Home/UsforAD_{cy}$ and $Home/UsforPT_{cy}$ respectively.[2] The two variables can also represent the self-sufficiency of country *c*'s broadcast television programming in year *y*. Then *Home/*

$UsforAD_{cy}$ and $Home/UsforPT_{cy}$ are regressed over the market scale and cultural distance measures as well as the year dummies, respectively. Note that the regressions are executed in the log form. Furthermore, as $\log AudBase_{cy}$ and $\log GDP_{cy}$ are highly correlated, the two variables are entered separately from each other into the regressions. Table 4 reports the estimation results. Model 9 shows that both $\log AudBase_{cy}$ and $\log CulDist_{c\text{-}US}$ are statistically significant in predicting $\log Home/UsforAD_{cy}$ ($p = .000$ and $p = .001$), with positive signs. These indicate an increase in a country's audience base size or its cultural distance from the U.S. would lead to an increase in the ratio of the homemade to U.S.-made programs' share in all-day airtime, which suggests an enhancement in the country's self-sufficiency in television programming. Model 10 replaces $\log AudBase_{cy}$ with $\log GDP_{cy}$ and the results show a positive and significant effect of $\log GDP_{cy}$ on $\log Home/UsforAD_{cy}$ ($p = .010$). This suggests that a wealthier country tends to be more self-sufficient in broadcast television programming.

Models 11 and 12 are regressions of the ratio of homemade to U.S.-made share in prime time. The results resemble what is found in Models 9 and 10. Both $\log AudBase_{cy}$ and $\log CulDist_{c\text{-}US}$ have a positive effect on $\log Home/UsforPT_{cy}$, and they are significant at high level ($p = .000$ and $p = .000$). $\log GDP_{cy}$ is also positively associated with $\log Home/UsforPT_{cy}$, though the relationship is not statistically significant ($p = .347$). In summary, the results of the $Home/UsforAD_{cy}$ and $Home/UsforPT_{cy}$ regressions further confirm the influences of the domestic market scale and the cultural distance from the U.S. on a country's self-sufficiency in broadcast television programming.

Table 4
Economic and Cultural Influence on Ratio of Homemade to U.S.-made Programs

	$\log Home/UsforAD_{cy}$				$\log Home/UsforPT_{cy}$			
	Model 9		Model 10		Model 11		Model 12	
Variable	*B*	*t*	*B*	*t*	*B*	*t*	*B*	*t*
Constant	−4.931***	−3.54	−1.967	−1.82	−6.264***	−5.00	−0.765	−0.60
$\log AudBase_{cy}$	0.402***	5.91			0.465***	6.37		
$\log GDP_{cy}$			0.339*	2.64			0.144	0.95
$\log CulDist_{c\text{-}US}$	0.261***	3.64	0.371***	3.90	0.323***	4.30	0.326**	3.22
D_{1972}	0.000	0.00	−0.153	−0.35	0.606	0.64	0.565	1.25
D_{1982}	−0.054	−0.06	0.087	0.21	0.473	0.50	0.776	1.70
D_{1991}	−0.196	−0.22	−0.018	−0.04	0.049	0.05	0.369	0.80
D_{2001}	−0.598	−0.66	−0.027	−0.06	−0.217	−0.23	0.516	1.10
R^2	0.431		0.204		0.489		0.194	
N	65		72		64		70	

Note. $*p < .05$. $**p < .01$. $***p < .001$.

Discussions and Conclusion

The findings affirm the home market effect on the airtime shares of homemade television programs in individual countries. The results show that the audience base size of a country is positively associated with its airtime share of homemade television programs and is negatively connected to its share of U.S.-made programs, both during all day and prime time. A larger audience base indicates more national demand for television programs, which attracts more advertisement or other types of financial support to benefit the domestic industry. This would in turn stimulate domestic program production and reduce the import of programs from the U.S. market. The findings suggest that the domestic market scale plays an importance role in the broadcasting of both homemade and U.S.-made television programs, which is consistent with the economic model of international media trade.

A country's per capita GDP is negatively associated with the share in all-day airtime of American television programs, which confirms earlier predictions by McFayden, Hoskins, and Finn (2003) and Straubhaar (2007). That is, a richer domestic television industry leads to a competitive advantage in producing and broadcasting homemade programs, and thus makes the country less rely on the importation of American television programs during all-day broadcasting. This provides additional supports for the economic model of international media trade.

Nonetheless, there is no significant relationship between a country's per capita GDP and its prime-time share of American programs. One possible explanation is that unlike the all-day broadcasting time, the prime-time broadcasting in a country is more likely to be regulated rather than being driven by the market force. For example, in South Korea, a limited number of prime-time slots is allocated to broadcast foreign programs and the domestic content dominates the prime-time broadcasting (Kim, 2011; United Nations Educational, Scientific and Cultural Organization, 2007).

The cultural difference between the U.S. and the importing country also accounts for the airtime shares of American television programs. The results indicate that a larger cultural distance from a country to the U.S. would lead to a higher reduction in the value of the American programs to the national audience in the country, which will consequently result in lower airtime shares of U.S.-made programs in the country. In this sense, the findings in this study are consistent with the cultural discount theory.

Furthermore, this study shows that a country's domestic market scale and its cultural distance from the U.S. also account for the ratio of homemade to U.S.-made television programs' shares, both during all-day-time and prime-time broadcasting. A country with larger and wealthier audience base has a greater ability of domestic production and broadcasting, and thus a higher level of self-sufficiency. A larger cultural distance between a country and the U.S. would lead to a higher reduction in the value of the American programs to the domestic audience in the country, which helps to prevent the penetration of U.S.-made programs and to obtain the self-sufficiency in broadcast television programming.

Additionally, this study explores the time trend in the airtime shares of homemade and U.S.-made television programs in individual countries and territories. Previous research compared the international flow of television programs in 1973 and 1983 and found that the flow patterns remained fundamentally the same (Varis, 1986). Nonetheless, the findings of this study indicate that across the past 50 years, the shares of homemade programs in all-day time and prime-time broadcasting decline over time, whereas the shares of American programs increase. Although the time trends are not significant in statistical terms, they imply a tendency of globalization and a propensity of cultural exchange to some extent. The globalization of cultural industry may enrich people's entertainment lives (Buonano, 2007). However, this also may lead to American penetration and homogenization, which would harm the balance and diversity of different cultures (Berger & Huntington, 2002; Schiller, 1971).

Taken together, this study provides supporting evidence for both the economic model of international media trade and the cultural discount theory in the international trade of television programs. Few studies have systematically measured the economic and cultural influences on the international flow of television programs, mainly due to the lack of data on cross-border trade of television programs. This research serves to fill in the gap and overcome the data problem by utilizing Straubhaar's (2007) data. In turn, this study contributes to the existing media trade literature and sheds light on the understanding of the complexity of the television program flows around the world and the national self-sufficiency of broadcast television programming.

This study also has practical implications. Previous literature has shown that the international trade market of media products tends to be dominated by a few importing countries (e.g., Fu, 2006; Hoskins & Mirus, 1988; Jayakar & Waterman, 2000). This asymmetric flow of media products may hinder the process of cultural diversity in a global sense. The findings of this study can provide some insights for policy makers on how to develop the self-sufficiency in program production and to maintain cultural diversity. A country with stronger and larger domestic television industry tends to broadcast more homemade programs and fewer U.S.-made programs. In order to resist the penetration of foreign media programs and encourage self-sufficiency, a country needs to put more financial investment to improve the infrastructure of its television program industry, and at the same time stimulate the national demand. In particular, media contents have been distributed over the Internet. Online television Web sites have become an important component of a country's television program industry. This trend requires more financial support on the development of domestic online television services, especially on increasing the quality and variety of online re-released television programs. Such investment could enlarge the audience size by attracting more young audience members, which in turn benefit the domestic television program industry.

On the other hand, for a country that is more culturally distinct from the U.S., it should take this advantage and produce more culturally specific programs to attract its domestic audiences as well as any overseas audiences who can possibly be

receptive to the similar culture. By producing and marketing content to an expanded audience market, one country can thereby strengthen its ability of production and programming. One notable example is the distinct type of television programs called telenovelas, which often reflect the culture, economics and politics of Latin American countries and thus are extremely popular in the region. By these means, domestic broadcasters can develop its own television program industry and maintain cultural distinctiveness.

This study is limited in some ways. First of all, this study covers only 20 nations and culturally defined territories. Other countries or regions are not included in the sample of this study, due to the data availability. As a result, the sample size of this study is relatively small. Future research encompassing more countries or media markets would be beneficial to reveal a fuller picture on the transnational flow of television programs.

Second, this study focuses on the airtime percentages of homemade and U.S.-made television programs broadcasted in a given country. However, a country may import television programs from other sources. Straubhaar (2007) has pointed out that the cultural trade within cultural-linguistic regions is large and growing, particularly in Latin America, Asia and the Middle East. In this sense, the flows of television programs in cultural-linguistic regions are worth investigating. Future research should include intra-regional television flows to reveal the complexity of the global picture on television program broadcasting.

Third, owing to the constraints of data availability, the dataset in this study includes only three explanatory variables, namely the audience base size, the per capita GDP and the cultural distance index. Other factors, for instance, the genre of a television program, may also impact the transnational flow. Television programs of different genres are associated with unequal abilities to overcome cultural barrier (Bielby & Harrington, 2008). Therefore, the program genre may affect the international flow of television programs and the national self-sufficiency, and thus an expanded examination of Straubhaar's full dataset may allow for that in the future.

Governmental regulations and policies may also affect the cross-border flow of television programs. Many countries have regulated the import of foreign media products to some extent. For instance, the European Union Broadcasting Directive requires its members to reserve a majority proportion of broadcasting time for European products and to limit the proportion of airtime for foreign programs (European Commission, 1989, 2007). In this sense, it would be rewarding to examine whether such limits of imported foreign programs have an influence on a country's self-sufficiency in television programming. However, due to the lack of available data, no measures for governmental regulations of the television industry are included in this study. Future research should refine the present model and introduce more measurements.

Finally, due to the data constraints, this study examines the international flow of television programs from 1962 to 2001. Future study examining the economic and cultural influences on the airtime shares of domestic and American programs in recent years could reveal a more complete picture of the cross-border trade

of television programs, and provide a better understanding about how a country develops national self-sufficiency in broadcast television programming.

Notes

[1]They are Australia, Brazil, Cameroon, Chile, China, Columbia, France, Hong Kong, India, Ireland, Israel, Italy, Jamaica, Japan, Lebanon, Mexico, New Zealand, Nigeria, South Korea, Taiwan, United Kingdom, and Venezuela.

[2]$Home/UsforAD_{cy} = HomeShareforAD_{cy}/USShareforAD_{cy}$
$Home/UsforPT_{cy} = HomeShareforPT_{cy}/USShareforPT_{cy}$

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