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Impact of Approved Destination Status on Chinese travel abroad: an econometric analysis

Shawn Arita, Christopher Edmonds, Sumner La Croix and James Mak

Shawn Arita, Sumner La Croix and James Mak are in the Department of Economics, College of Social Sciences, University of Hawaii at Mānoa. Christopher Edmonds (corresponding author) is with the Center on Family, College of Tropical Agriculture and Human Resources, University of Hawaii at Mānoa, 2515 Campus Road, 103 Miller Hall, Honolulu, Hawaii 96822, USA. E-mail: cedmonds@hawaii.edu.

Since the early 1990s, China's government has negotiated Approved Destination Status (ADS) with 120 countries. The agreements allow government-approved travel agencies to market group tours and obtain visas in bulk to ADS destinations. The authors apply a fixed-effects estimation model to analyse how ADS has affected outbound tourist travel from China, using visitor arrivals data from 61 foreign destinations from 1995 to 2005. Various model specifications indicate that ADS has resulted in significant increases in arrivals from China, averaging 52% over three years. The authors also find evidence of travel diversion as more countries have received ADS.

Keywords: China outbound travel; Approved Destination Status; travel liberalization

Compared to its Asian neighbours, the People's Republic of China (hereafter referred to as China) was a latecomer to international outbound pleasure travel. China officially allowed its nationals to travel abroad for pleasure in 1990 and subsequently adopted a selective and incremental approach to the liberalization of overseas pleasure travel by specifying which countries its citizens could visit. Beginning in 1995, the Chinese National Tourism Administration (CNTA)

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formalized the Approved Destination Status (ADS) programme under which countries designated as approved destinations could market group leisure tours in mainland China in cooperation with government-approved travel agencies.[1]

Travel agencies in China can only sell package tours to destinations with ADS agreements. Individuals in China who wish to travel to an approved destination can obtain visas arranged in bulk by a government-approved travel agency. ADS agreements have paved the way for much easier tourist travel abroad than previously was possible. By granting ADS designations to countries selectively and incrementally, China's approach to the liberalization of overseas pleasure travel by its citizens stands in contrast to earlier across-the-board liberalization of overseas pleasure travel by Japan and South Korea.[2] By the end of 2008, China had awarded ADS to 120 countries, of which only 104 were operational.[3]

In this paper, we review the history briefly and consider the possible motivations behind China's ADS programme. A fixed effects estimator is used to estimate the effect of ADS on visitor arrivals. We report results from several specifications of the model to assess the impact of ADS agreements on Chinese visitor arrivals in over 60 countries between 1995 and 2005.

Our econometric model is based loosely on the gravity model, a workhorse of empirical international trade analysis. It has been widely used to estimate the effects of trade agreements on trade flows (Clarete *et al*, 2003; Rose, 2004; Baier and Bergstrand, 2007). Application of the gravity model to tourism analysis has appeared more recently. For example, Eilat and Einav (2004) used a gravity model specification to analyse the determinants of international tourism flows. Gil-Pareja *et al* (2007) employed the gravity model to estimate the magnitude of the increase in tourism flows among European Monetary Union countries due to the introduction of the euro. Neiman and Swagel (2009) applied a gravity model to analyse the impact of post-9/11 visa policies on travel to the USA.

Rising Chinese demand for outbound tourist travel has spawned a growing body of publications and research programmes that focus on the analysis of mainland Chinese travel abroad. Most of this research has been descriptive and has not employed formal theoretical models or econometric methods. We are unaware of any econometric analyses that attempt to estimate the effects of ADS on mainland Chinese overseas travel. This paper fills this gap in the literature, addressing two main questions. First, how much, if at all, does ADS affect the volume of visitor arrivals from China to the country with the ADS agreement? Second, when an additional country negotiates an ADS agreement, how does the agreement affect the flow of mainland Chinese tourists to other countries in our sample? Mak and White (1992) found that in both Japan and South Korea, which removed barriers on outbound pleasure travel to all countries in a single stroke in 1964 and 1989, respectively, the total volume of overseas travel from both countries increased sharply. The very high tourism growth that Japan and Korea experienced in the years immediately following travel liberalization may be attributed to a 'catch up' transition period, as outbound tourism from these countries caught up with long-term trends. Because liberalization of travel from Japan and Korea applied to virtually all countries and increased visitor flows to all countries, it could be characterized as *travel augmenting*. In contrast, China's travel liberalization has involved negotiating ADS with individual countries, which would be expected to increase travel to

those countries, but could also lead to diversion of travellers from other destinations. Thus, our empirical analysis considers whether China's selective liberalization is *travel diverting* as well as travel augmenting.

Background

Outbound pleasure travel from China began in 1983 when mainland Chinese from Guangdong Province were permitted to travel to Hong Kong on organized tours to visit relatives. This privilege was extended the following year to include visits to Macau, with residents from additional provinces permitted to join the tours as long as they had relatives or friends in Hong Kong or Macau (WTTC, 2003, p 22; Lim and Wang, 2005, p 2247).

During the 1990s, China's government negotiated ADS agreements with a small number of neighbouring countries in the Asia region. In 1991, China's government allowed travel on group tours to Malaysia, Singapore and Thailand (WTTC, 2003, p 22; Lim and Wang, 2005, p 2247). These tours were organized by the Chinese Travel Service (CTS) and were available from a few of China's more affluent coastal cities. By the end of the decade, there were nine ADS agreements in place, including the ones with Hong Kong and Macau (Table 1).

Starting in 2000, the pace at which ADS agreements were negotiated between China and other countries accelerated sharply, as did the number of mainland Chinese departures to foreign destinations (Table 1 and Figure 1).[4] By 2008, the number of international departures from mainland China reached 46 million, including visits to Hong Kong and Macau (Arlt, 2009).[5]

China's selective and incremental travel liberalization is consistent with the gradual and regulated liberalizations carried out by the government in other areas of economic policy – for example, foreign direct investment, currency and exchange rate, agricultural reform and state-owned enterprise reform. From the perspective of the Chinese government, there are a number of advantages to gradual liberalization. It has enabled the country's leadership to satisfy, to some extent, the pent-up demand for travel abroad among its increasingly affluent citizens.[6] At the same time, it has enabled policy makers to monitor and adjust travel policy based on early experience with initial ADS destinations. Because countries gaining ADS designation expect to reap substantial economic benefits,[7] an ADS agreement represents a bargaining chip that China's government can use in its diplomatic negotiations on other issues and can serve to strengthen relations with countries.[8] Early negotiation of ADS status with nearly all China's neighbours in the Asia region has likely helped China's government improve its political relations and facilitate economic integration with its strategically important neighbours.[9]

Casual examination of pre- and post-ADS visitor numbers highlights the heterogeneity of the impacts of ADS across different countries. Table 2 summarizes average growth rates in visitor arrivals from China during the three years before and the three years after ADS was obtained and compares these rates to the overall growth rate of outbound international travel from China during the corresponding periods. Pre- and post-ADS growth rates of Chinese visitor arrivals vary substantially across countries. Three countries actually had

Table 1. Approved destination status (ADS) agreements by year.

Year	Recipient	Cumulative total with ADS
1983	Hong Kong, Macau	2
1988	Thailand	3
1990	Malaysia, Singapore	5
1992	Philippines	6
1998	South Korea	7
1999	Australia, New Zealand	9
2000	Brunei, Cambodia, Japan, Myanmar, Vietnam	14
2002	Egypt, Indonesia, Malta, Nepal, Turkey	19
2003	Croatia, Cuba, Germany, Hungary, India, Maldives, Pakistan, South Africa, Sri Lanka	28
2004	Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Ethiopia, Finland, France, Greece, Iceland, Ireland, Italy, Jordan, Kenya, Latvia, Liechtenstein, Lithuania, Luxembourg, Mauritius, Netherlands, Norway, Poland, Portugal, Romania, Seychelles, Slovakia, Slovenia, Spain, Sweden, Switzerland, Tanzania, Tunisia, Zambia, Zimbabwe	63
2005	Antigua and Barbuda, Barbados, Brazil, Chile, Fiji, Jamaica, Lao PDR, Lesotho (B), Mexico, Northern Mariana Islands, Peru, Russia, UK, Vanuatu	77
2006	Algeria (B), Bahamas, Benin (B), Botswana (B), Cameroon (B), Gabon (B), Grenada, Madagascar (B), Mongolia, Mozambique (B), Nigeria (B), Rwanda (B), Saint Lucia (B), Tonga, Uruguay (B)	92
2007	Andorra, Argentina, Bangladesh, Bulgaria, Monaco, Morocco, Namibia, Oman, Syria, Trinidad and Tobago (B), Uganda, USA, Venezuela	105
2008	Costa Rica (B), Federated States of Micronesia (B), French Polynesia, Israel, Lebanon (B), Taiwan	111
2009	Cape Verde, Dominica, Ecuador, Ghana, Guyana, Mali, Montenegro, Papua New Guinea, United Arab Emirates	120

Sources and notes: China National Tourism Administration (2009) and a list from Professor Zélia Breda (personal communication). The list covers ADS agreements through September 2009. The CNTA and Breda lists are the same through 2004. The Breda list has more ADS countries (120) than the CNTA list (104), and the additional countries on the former appear to involve countries that have signed a Memorandum of Understanding with China for ADS but have not made the agreements operational. ADS countries on the Breda list but not the CNTA list are designated by (B).

post-ADS visitor arrival growth rates that were lower than pre-ADS growth rates. These cases coincided with shocks that clearly reduced interest in travel to these countries – for example, the Indian Ocean Tsunami (Maldives) and increases in the intensity of fighting related to ongoing civil wars (Nepal and Sri Lanka). The muddied picture that emerges from a casual inspection of the descriptive statistics on the growth of mainland Chinese visitor arrivals highlights the need to use multivariate regression analysis to control for the many confounding factors that influence visitor growth rates.

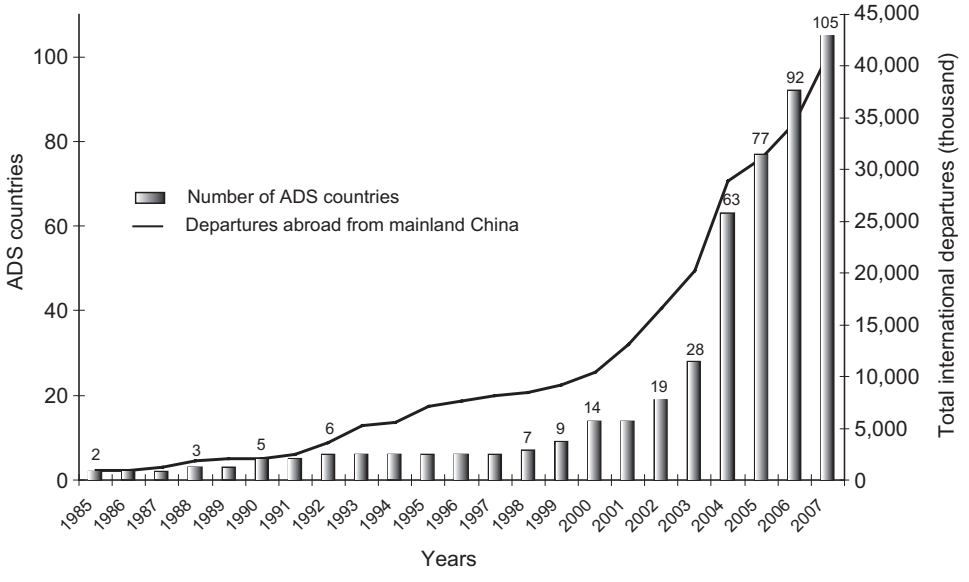

Figure 1. Number of ADS countries and international departures from China. *Sources*: Number of departures from World Tourism Organization (2004a, 2006, 2007), verified and filled in with data from NTA online data among recipient countries. Number of ADS countries from CNTA (2009) and list from Professor Zélia Breda (personal communication).

Model specification, data and empirical results

We employ a fixed effects estimation model to examine international tourist travel from China. Each of the specifications uses visitor flows as the dependent variable since time-series data on visitor expenditures between pairs of countries are rarely available. Our estimates are derived from the gravity model developed by Anderson and van Wincoop (2003). When unobserved country characteristics are time invariant, a typical strategy to allow identification of the effect of a 'treatment' (such as an ADS agreement) is to estimate the regression using a fixed effects estimator. Following Feenstra (2002), we employ a fixed effects specification to estimate the effects of ADS on tourist arrivals from China in approved destinations on a panel data set of annual observations of visitor arrivals in countries receiving visitors from China during the years from 1995 to 2005.

We estimate various specifications of the following regression:

$$\ln(Visitor\_Arrivals_{it}) = \beta_0 + \phi ADS_{it} + \beta_1 \ln(DEST\_GDP\_PC_{it}) +$$

$$\beta_2 \ln(CHINA\_GDP\_PC_t) + \beta_3 \ln(W\_NADS_t) + \eta_i + \varepsilon_{it}$$

where $\ln(Visitor\_Arrivals_{it})$ is the number of mainland Chinese visitor arrivals in destination i during year t; ADS_{it} is a vector of binary variable indicating a country's approved destination status in year t, $t-1$ and $t-2$.[10] Because the full impact of ADS on visitor flows may take time to be realized, we estimate

Table 2. Average growth rates in visitor arrivals from China.

Country (ADS year)	Average growth rate in Chinese visitor arrivals		
	3 years before ADS	3 years after ADS	Difference
	(1995–1997)	*(1998–2000)*	
South Korea (1998)	0.153	0.295	0.142
China overall	*0.415*	*0.229*	*–0.186*
	(1996–1998)	*(1999–2001)*	
Australia (1999)	0.216	0.274	0.058
New Zealand (1999)	0.250	0.482	0.231
China overall	*0.249*	*0.189*	*–0.601*
	(1997–1999)	*(2000–2002)*	
Cambodia (2000)	0.105	0.292	0.187
Japan (2000)	0.069	0.154	0.084
Vietnam (2000)	0.087	0.148	0.061
China overall	*0.178*	*0.236*	*0.057*
	(1999–2001)	*(2002–2004)*	
Egypt (2002)	0.175	0.361	0.186
Indonesia (2002)	0.070	0.166	0.096
Nepal (2002)	0.610	0.209	–0.401
Turkey (2002)	0.112	0.136	0.024
China overall	*0.189*	*0.194*	*0.005*
	(2000–2002)	*(2003–2005)*	
Cuba (2003)	0.171	0.267	0.096
Germany (2003)	0.151	0.175	0.024
India (2003)	0.368	0.433	0.065
Maldives (2003)	0.455	0.059	–0.396
Pakistan (2003)	0.086	0.516	0.430
South Africa (2003)	0.106	0.192	0.086
Sri Lanka (2003)	0.381	0.330	–0.051
China overall	*0.236*	*0.141*	*–0.095*

Note: '3 years after ADS' includes the year in which ADS was implemented.

specifications with one-year and two-year lags on the ADS variable.[11] Inclusion of country fixed effects means that time-invariant control variables cannot be included in the regression, but these are captured in the fixed effects term.

Our specifications use two proxies for the quality (attractiveness) of the country as a tourist destination: the destination country's GDP per capita ($DEST\_GDP\_PC_{it}$) and total GDP ($DEST\_GDP_{it}$). The specification includes two time-varying controls: Chinese income per capita ($China\_GDP\_PC_t$) and the cumulative (weighted) number of countries that have been awarded ADS agreements (W_NADS_t).[12] Inclusion of $China\_GDP\_PC_t$ allows estimation of the income elasticity for Chinese outbound travel and provides another check on the model's plausibility. The two GDP variables also provide information on the level of economic development and the variety and quality of goods and services available at destinations within the country. Inclusion of $\ln(W\_NADS_t)$

also provides a test for trade diversion, which can occur when additional countries receive ADS agreements.

Data on visitor arrivals from mainland China cover 61 countries. Made up of the leading international tourist destinations (in terms of total number of foreign visitors) during 1995–2005, these 61 countries accounted for most of the international trips by mainland Chinese.[13] For instance, in 2005, the *Yearbook of Tourism Statistics, 2001–2005* (World Tourism Organization [UNWTO], 2007) reported that 110 countries received 8.10 million visitor arrivals from China; the 61 countries in our sample accounted for 7.39 million (more than 90%) of these visitors. Our analysis excludes mainland Chinese visitor arrivals in Hong Kong and Macau, since these can be considered domestic destinations after reunification with China in 1997 and 1999, respectively. Data for a few larger tourist destination countries (such as France and the Philippines) and several small countries (such as Pacific island countries) had missing years of data, displayed suspicious volatility in the volume of visitor arrivals, or reported very few visitors from China, so we excluded them from our sample.[14]

The UNWTO data were checked against arrivals statistics compiled by individual country national tourism agencies (NTAs). When our review of visitor statistics from NTAs suggested the UNWTO data contained coding errors or referenced out-of-date figures, we substituted data from NTA sources.[15] Because a small number of the countries included in the data set have missing data for some years, the final data set is an unbalanced panel. The Appendix details the definitions and references for all variables used in our estimations.

Table 3 summarizes estimation results from six specifications of the fixed effects model. Estimates examine the impact of current and lagged ADS variables on mainland Chinese visitor arrivals in ADS countries. Estimated coefficients on all current and lagged ADS variables are positive in all six specifications. ADS_{it} is statistically significant at the 1% level in specifications with only a current-year ADS variable (Table 3, columns 3 and 6). In specifications with current-year ADS and one-year lag ADS variables (columns 2 and 5), the current-year ADS variables are significant at the 1 and 5% levels, and one-year lags of ADS status are significant at the 5% level. When a second-year lag of the ADS (ADS_{it-2}) is added (columns 1 and 4), estimated coefficients on this variable are statistically significant at the 10% level, while those on ADS_{it} are significant at the 1 and 5% levels, and ADS_{it-1} are not statistically significant.[16]

The estimated coefficients on the ADS binary variables can be expressed in terms of the percentage changes in Chinese visitor arrivals, and we find that the impact of ADS increases as we include one- and two-year lags of ADS in the regressions. When only a current ADS variable is included, ADS increases visitor flows by 35.4 to 37.0%.[17] When one ADS lag is included, the cumulative impact rises to a range of 43.4–44.5%. When a second ADS lag is added, the cumulative impact rises to 52.2%. These results indicate that the ADS agreements increase travel to ADS countries positively and significantly, thus indicating the trade-augmenting effect of ADS.

Estimated coefficients on $\ln(CHINA\_GDP\_PC_t)$ can be interpreted as elasticities; they vary between 1.17 and 1.48 across the six specifications and are statistically significant at the 1% level.[18] These estimates are somewhat

Table 3. Fixed effects estimates: visitor arrivals, 1995–2005.

	Model specifications					
	(1)	(2)	(3)	(4)	(5)	(6)
Constant	–27.773***	–29.068***	–29.970***	–8.447**	–8.816**	–9.036***
	(10.230)	(9.874)	(9.538)	(3.480)	(3.423)	(3.386)
ADS_{it}	0.214***	0.206***	0.319***	0.201***	0.192**	0.307***
	(0.073)	(0.073)	(0.088)	(0.073)	(0.074)	(0.087)
ADS_{it-1}	0.107	0.202**	–	0.104	0.207**	–
	(0.067)	(0.082)	–	(0.067)	(0.080)	–
ADS_{it-2}	0.167*	–	–	0.183*	–	–
	(0.094)	–	–	(0.095)	–	–
$DEST\_GDP_{it}$	1.144**	1.201***	1.244***	–	–	–
	(0.455)	(0.440)	(0.425)	–	–	–
$DEST\_GDP\_PC_{it}$	–	–	–	0.899*	0.949*	0.989**
	–	–	–	(0.502)	(0.493)	(0.489)
$CHINA\_GDP\_PC_t$	1.206***	1.190***	1.172***	1.482***	1.479***	1.470***
	(0.298)	(0.295)	(0.294)	(0.281)	(0.280)	(0.280)
W_NADS_t	–0.140***	–0.138***	–0.138**	–0.130**	–0.141***	–0.132**
	(0.052)	(0.052)	(0.052)	(0.052)	(0.052)	(0.052)
Sample size	586	586	586	586	586	586
Within R^2	0.546	0.543	0.539	0.541	0.538	0.533
Percentage change due to ADS	52.2	44.5	37.0	52.2	43.4	35.4

Notes: Standard errors in parentheses. Continuous variables estimated in natural logs. ***, ** and * estimated coefficients are statistically significant at the 1%, 5% and 10% levels, respectively.

lower than income elasticities for international travel from Northern Europe (2.06), Oceania (2.55) and developed Asia (4.45), are commensurate (in their upper range) with elasticities for North America (1.74) and Southern Europe (1.67) and are much larger than the elasticity for Latin America (0.28) (Crouch, 1994). Estimated coefficients on $\ln(DEST\_GDP_{it})$, are, as expected, uniformly positive and are statistically significant in the three specifications using total rather than per capita GDP (Table 3, columns 1–3). While in the three specifications using $\ln(DEST\_GDP\_PC_{it})$ (Table 3, columns 4–6), estimation coefficients are significant at only the 5% level in one of the three specifications and at the 10% level in the other two. Implied elasticities of destination attraction to Chinese visitors with respect to changing income in the destination countries range from 0.90 to 0.99 for $DEST\_GDP\_PC_{it}$ and from 1.14 to 1.24 for $DEST\_GDP_{it}$.

Estimated coefficients on $\ln(W\_NADS_t)$ are uniformly negative and statistically significant at the 1 and 5% levels. The elasticities of visitor arrival diversion (that is, the marginal change in mainland Chinese visitor arrivals as the total number of ADS countries rises) are small but economically significant, ranging from –0.13 to –0.14. Thus, a 10% increase in weighted ADS agreements reduces visitor arrivals from China at each destination receiving Chinese tourists – with or without ADS – by 1.3–1.4%. The finding that ADS

agreements divert as well as augment travel is not surprising given the preferential treatment of selected countries under the ADS policy. Preferential bilateral or regional trade agreements are expected to divert trade from other countries, and ADS agreements fit neatly into this category of preferential liberalization.

Conclusion

Our research yields two important empirical findings. First, results provide empirical evidence that ADS status has increased Chinese visitor arrivals substantially in ADS countries. Coefficients for the binary variable indicating ADS status as well as one- and two-year lags of ADS status were positive and statistically significant. We found that three years after receiving ADS, the number of Chinese visitors increased by an average of between 35.4 and 52.1%.

Nonetheless, caution is warranted in interpretation of our results. First, they were derived from the experiences of countries that were early recipients of ADS designations, as the last year covered in our data set was 2005. Of the 120 countries with ADS (through 2009), 43 received ADS after 2005. Second, the estimated results cover a period in which China actively liberalized its policies toward international travel. Recalling the very high rates of outbound international travel growth that followed earlier instances when other East Asian countries relaxed stringent restrictions on international travel (Japan in 1964 and Korea in 1989), one can expect that outbound international travel by mainland Chinese will grow at very high rates in the immediate post-liberalization years as pent-up consumer demand is satisfied and the country catches up with long-run travel propensities. Thus, our estimates of the impact of ADS on early adopters can be expected to overstate the impact of ADS on later adopters. Third, our results indicate that the expansion of ADS agreements has led to some travel diversion from existing destinations to new ADS recipient countries. Nonetheless, we find that the travel-augmenting effect of ADS liberalization dominates the travel-diverting effect and, overall, ADS has increased greatly the number of mainland Chinese travelling to foreign destinations.

We are also aware of the limitations of cross-country empirical analysis. Measurement error in both dependent and independent variables is inherent when data are collected across 61 countries. Proxy variables for the attractiveness of destination countries and simple binary characterization of ADS agreements that differ somewhat among countries are examples of variables with measurement errors in our analysis. The existence of time-varying relative differences in resistance to foreign travel can lead to omitted variable bias since the fixed effects estimator can only control for unobserved variables that do not vary over time. Also, the estimation procedures applied treat ADS as exogenous to visitor flows, but we recognize that it could be endogenous. The existence of time-varying relative differences in resistance to foreign travel leads to omitted variable bias, since fixed effects estimates control for unobserved heterogeneity between countries only if these are fixed over time. The estimates reported in the paper can also be criticized for treating which countries negotiate ADS agreements with China as randomly determined (and exogenous

to travel flows before ADS), when it is clear that China and the countries with which ADS has been negotiated do not represent a random sample of all countries.

Propensity score-matching methods could potentially be used to resolve these problems. These shortcomings suggest a promising course of future work to derive more precise estimates of the effect of ADS on outbound international travel. Nonetheless, these early results provide important information about the impact of ADS. Though admittedly imprecise, estimation results on the ADS variables were obtained consistently across various model specifications and displayed magnitudes of effects on mainland overseas travel to suggest that ADS has had a large positive effect on this travel.

Endnotes

1. More precisely, tour operators from countries with ADS must work with approved travel agencies in China to market group package tours. Before travel liberalization, mainland Chinese could travel abroad on official and business trips or to study abroad, but not on pleasure trips. Those who wished to go on pleasure trips had to state some other acceptable reason for their trips.
2. See Mak (2004), Chapter 9, and Mak and White (1992).
3. The total number of ADS agreements negotiated is from China National Tourism Administration [CNTA] (2009) and a list from Professor Zélia Breda (personal communication) and covers ADS agreements through September 2009. The number of operational ADS agreements is based on CNTA (2009).
4. However, some of these countries have not initiated group tours under ADS rules (European Travel Commission, 2007, p 9).
5. In 2005, the number of visitor arrivals in Hong Kong and Macau from China totalled 23 million; all other countries (where data on arrivals from mainland China were available) received slightly over 8 million visitors from China (World Tourism Organization, 2007).
6. Under the ADS programme, the Chinese do not necessarily have the option to travel to countries they prefer. For example, Kim *et al* (2005) found that while Chinese indicated strong interest in travel to the USA, the USA did not receive an ADS designation until December 2007. Chinese travel under the ADS agreement with the USA started in June 2008.
7. There are also some potential costs. Foremost among the concerns were problems with visitor screening, espionage and visitors overstaying their visas (Sofield, 2002; Arlt, 2006, p 43). One method employed by travel agencies in China to prevent visitor overstays is to collect large deposits from their customers travelling to some countries; the deposits are returned on their return. For example, mainland Chinese tourists visiting the EU must post security bonds of 50,000–100,000 yuan with their travel agencies. Travel agencies that have an excessive number of non-returnees could have their designation as ADS travel agencies revoked. Not surprisingly, travel agencies have developed their own extra-government controls to discourage overstays. See Sofield (2002) for examples.
8. For example, Costa Rica negotiated ADS in 2008, the year after it broke off formal diplomatic relations with Taiwan.
9. Kim *et al* (2005, p 212) report seven factors that they believe Chinese government officials review when they consider a country for ADS designation: 'First, the countries should generate outbound tourists to China. Second, the country should have a favorable political relationship with China. Third, the countries should have attractive tourist resources and suitable facilities for Chinese travelers. Fourth, the safety of the Chinese travelers should be guaranteed along with freedom from discrimination. Fifth, the destination countries should be easily accessible by transportation. Sixth, the outbound tourists from the destination countries should have a balance with China in terms of tourists' expenditures. Seventh, the market share of tourists from foreign countries to China, along with tourists from China to these countries, should be increased reciprocally.'
10. ADS_{it} is defined relative to a three-year period, and because no countries have rescinded ADS, the value of ADS_{it}, ADS_{it-1} and ADS_{it-2} each take on a value of 1 three years after ADS was first agreed to by country i and China. Reliance on a simple 0/1 dummy variable to characterize

ADS glosses over differences in the extent of travel liberalization encompassed in ADS agreements. Unfortunately, objective characterization of the differences across ADS agreements in quantitative indicators has proved unpersuasive.

11. Baier and Bergstrand (2007) adopt a similar approach for testing the effects of Free Trade Agreements on trade volumes.
12. We weighted a country's ADS status by its share in world tourism flows. Weights are necessary to account for the differential impacts of ADS agreements with smaller and larger tourism industries.
13. World Tourism Organization's *Yearbook of Tourism Statistics* (UNWTO, various years). See the Appendix for the list of countries included.
14. For example, France reported arrivals of Chinese together with arrivals from other East Asian nations and therefore had to be dropped. We dropped the Philippines from our sample when we judged the year-to-year fluctuations in arrivals from China to be implausible. Additionally, a few other countries (Monaco and Myanmar) had to be dropped when critical explanatory variables, such as GDP per capita, were unavailable.
15. For example, in some cases the UNWTO database reported visitor arrivals for 'Chinese nationals' one year and visitor arrivals for 'Chinese residents' the next year. We have constructed a consistent series of visitor arrivals for each country by correcting or adjusting inconsistent series using data reported by national tourism agencies.
16. The estimated coefficient on ADS lagged one year is not statistically significant at the 10% level using a two-tail *t*-test, but is statistically significant using a one-tail *t*-test. The one-tail test is appropriate, as trade theory informs us that elimination of an export quota (that is, China's prohibition of group tourism travel to non-ADS countries) should lead to an increase in exports (outbound visitors from China).
17. The estimated coefficient on a dummy variable in a semi-logarithmic regression must be transformed in order to interpret it as a percentage effect on the dependent variable. We apply a simple transformation proposed by Kennedy (1981) that yields an unbiased estimator of the percentage change.
18. The UNWTO's 2020 travel forecasts (UNWTO, 2004b) assumed that growth in per capita income would be the primary driver of international tourism from China; the research team assumed an income elasticity of demand for Chinese outbound travel of 2.0 (based on personal communication with staff from the UNWTO regarding the organization's 2020 forecasts).

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Appendix

Countries and years included in the data set

	Destination country	Years		Destination country	Years
1	Albania	1999–2005	34	Morocco	1995–2005
2	Australia	1995–2005	35	Myanmar	1998–2005
3	Bahrain	1995–2005	36	Nepal	1995, 1999–2005
4	Bangladesh	1995–2005	37	New Zealand	1995–2005
5	Belgium	1995–2005	38	Nicaragua	1999–2005
6	Botswana	1995–2004	39	Nigeria	1995–2005
7	Brazil	1995–2005	40	Pakistan	1995–2005
8	Bulgaria	1995–2005	41	Papua New Guinea	1997–2005
9	Cambodia	1995–2005	42	Peru	1995–2005
10	Canada	1995–2005	43	Poland	1995–2005
11	Chile	1995–2005	44	Romania	1995–2005
12	Costa Rica	1995–2005	45	Russia	1999–2005
13	Cuba	1995–2005	46	Saudi Arabia	2000–2005
14	Egypt	1995–2005	47	Singapore	1995–2005
15	Finland	1995–2005	48	Slovak Republic	1997–2005
16	Germany	1995–2005	49	South Africa	1995–2005
17	Ghana	1999–2005	50	Spain	1995–1998
18	Guatemala	1995–2005	51	Sri Lanka	1995–2005
19	Honduras	1999–2005	52	Switzerland	1997–2003, 2005
20	India	1995–2005	53	Thailand	1995–2005
21	Indonesia	1995–2005	54	Turkey	1995–2005
22	Iran	1995–2002	55	Uganda	1999–2005
23	Israel	1995–2005	56	Ukraine	1998–2003, 2005
24	Italy	1995–2005	57	UK	1995–2005
25	Japan	1995–2005	58	USA	1995–2005
26	Jordan	1995–2005	59	Venezuela	1995–2005
27	Kazakhstan	2000–2005	60	Vietnam	1995–2005
28	Korea	1995–2005			
29	Kuwait	1999–2004		Special Administrative Regions[a]	
30	Lao PDR	1995–2005			
31	Lebanon	1999–2005		Hong Kong	1995–2005
32	Malaysia	1995–2005		Macau	1995–2005
33	Maldives	1999–2005			

Note: [a]Data on Hong Kong and Macau were excluded from the sample used in the gravity model estimates.

Variable definitions and data sources

Visitor arrivals from China (*Visitor_Arrivals*$_{it}$). World Tourism Organization (2004a and 2007), verified and filled in with data from National Tourism Agency online data among recipient countries.

ADS status (*ADS*$_{it}$). Dummy variable taking a value of 1 if country has an ADS agreement with China and 0 otherwise. Variable created based on reports of China National Tourism Administration (2009) and a list from Professor Zélia Breda (personal communication). The list covers ADS agreements through September 2009. The CNTA and Breda lists are the same through 2004. The Breda list has more ADS countries (120) than the CNTA list (104) and the additional countries on the former appear to involve countries that have signed a Memorandum of Understanding with China for ADS, but had not, as of November 2009, given firm indications that ADS had been implemented.

China real GDP per capita (*CHINA_GDP_PC*$_t$). World Bank (2009). *World Development Indicators* (online database). Reported in year 2000 US$. Statistics retrieved in March 2009.

Destination per capita GDP (*DEST_GDP_PC*$_{it}$). World Bank (2009). *World Development Indicators* (online database). Reported in year 2000 US$. Statistics retrieved in March 2009.

Cumulative ADS agreements (*W_NADS*$_t$). The number of countries with ADS agreements in a given year weighted by the proportion of total tourism arrivals to the rest of the world (weights are based on year 2000 arrivals). *World Development Indicators* (online database). Statistics retrieved in October 2009.