

THE IMPACT OF POST-9/11 VISA POLICIES
ON TRAVEL TO THE UNITED STATES

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This paper examines the impact of post-9/11 changes in visa and security policy on business and leisure travel to the United States. American businesses, tourism industry representatives, and politicians pointed to changes in visa policies as leading to a sharp decline in short-term visitors following the September 11 attacks. Several foreign governments likewise complained that visa requirements and other security measures were making it difficult for their citizens to travel to the United States. Using an empirical model which distinguishes the impact of visa policy from economic and country-specific factors, we find that changes in visa policy are not associated with a decrease in travel to the United States. Rather, the reduction in entries was largest among travelers who were not required to obtain a visa.

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1 Introduction

The number of business and leisure travelers arriving in the United States dropped sharply following the terror attacks of September 11, 2001. The number of non-immigrant visitors fell by more than 17 percent from October 2002 to September 2003 (the government's fiscal year 2003) compared to the number of visitors in fiscal year 2000, and travel to the United States had not recovered even by late 2005 (Figure 1). In contrast, the number of legal permanent immigrants did not change appreciably, though illegal immigration is believed to have declined slightly after 9/11 in response to stepped-up security measures.¹ This paper examines whether changes in visa policy, which applied only to potential visitors from certain countries, were the key contributors to the decline in short-term travel to the United States, or whether economic or other factors such as more stringent airport security had a larger impact on travel. Our results do not apply to foreigners seeking to study in the United States, since our data do not include longer-term arrivals such as students.

In the wake of the attacks, the U.S. government enhanced a wide range of border security policies. Steps taken included both visible changes in security procedures at airports and other entry points that affect all visitors, as well as changes in policies governing visa issuance that affect only travelers who require a visa to enter the United States. The changes in visa policy were not surprising in the wake of the attacks, since the 9/11 terrorists had entered the United States with legitimate visas.

Commentators in both the public and private sectors have claimed that tougher visa policies account for the decline in travel to the United States, and expressed concern that post-9/11 visa policies hurt businesses by straining relationships with customers and hindering opportunities for

¹ Passel (2005) estimates that about 700,000 unauthorized immigrants entered the United States per year during 2000-2004, compared with 750,000 per year during 1995-1999.

new business. Foreign officials likewise complained that travel had become overly burdensome for their citizens. A Federal Reserve Bank of Dallas publication reported that companies have warned that the new visa requirements give competitors in other countries an advantage by making it difficult to arrange for customers to visit their U.S. facilities (Orrenius 2003). A Migration Policy Institute press release directly attributed the reduction in aggregate non-immigrant entries to post-9/11 changes in visa policy (Migration Policy Institute). Even cello virtuoso Yo-Yo Ma chimed in, testifying in 2006 to a House of Representatives committee that “extraordinarily high” barriers arising from visa policy were stifling cultural interchange (Ma 2006).

This paper assesses the impact of the post-9/11 security regime on non-immigrant entries to the United States. While there is a literature on the economic influences of permanent immigration patterns, we are aware of no recent economic analysis in the research literature that examines the impact of economic, geopolitical, and security-related factors on business and leisure travel.² To distinguish the effects of visa policy from other factors such as more general security measures and the psychological impact of the attacks, we look at the different impact of the 9/11 attacks on travel by visitors who are required to obtain a visa to enter the United States and visitors who do not need a visa. To do this, we group countries by their participation in the visa waiver program, a section of the U.S. legal code under which citizens of 27 countries (as of early 2007) are allowed to visit the United States temporarily without first obtaining a visa. The countries included in the visa waiver program are those whose citizens are deemed unlikely to pose a security threat and are expected to leave the United States in line with immigration rules (Table 1). In 2003, entries under this program represented roughly half of all overseas visitors to

² Orrenius (2003) writes a clear and broad analysis of related issues, but addresses a general audience outside of a research framework.

the United States (Siskin, 2004). Canadian nationals can also visit the United States without a visa and are thus included with citizens of countries in the visa waiver program.

All travelers are subject to routine security restrictions such as examination of their luggage on arrival into the United States, but only visitors from countries that do not participate in the visa waiver program are affected by changes in non-immigrant visa policy. Our econometric approach is based on this distinction: some changes in overall security policy after 9/11 applied to all visitors to the United States, but changes in visa policy applied only to certain travelers. The difference in treatment between travelers who must obtain a visa and those who can enter without one provides a policy-induced variation by which to assess the impact of changes in the formal visa regime that took place in the wake of the 9/11 attacks.

The analysis suggests that stricter visa policy did not play a salient role in reducing travel to the United States in the two years following the September 11 attacks. After taking into account economic and geopolitical effects, entries from countries not requiring a visa fell by more after 9/11 than visits by people required to obtain a visa, and this difference is statistically significant in most econometric specifications.³

Several factors could explain the disproportionate decline in travel by visitors who did not require a visa. One possibility is that the 9/11 attacks had a greater psychological effect on citizens of countries in the visa waiver program, leaving them more reluctant to travel to the United States than citizens of other countries. Another possibility is that the heightened security screening and other burdensome informal barriers that contribute to the “hassle factor” of travel represented a proportionately larger incremental aggravation for travelers who did not require a visa, resulting in a larger reduction in entries from these countries. Under this view, people

³ Our conclusion that visa policy was not the primary cause of reduced non-immigrant entries should not be applied to foreigners coming to the United States on student visas. This is because the factors behind a decision to study

asserting that travelers requiring a visa were materially impacted by new obstacles after 9/11 might well have been correct, but what they could not see was that travelers who did not require a visa, such as nationals of France or the UK, were now being scrutinized as well. Since British and French nationals received little scrutiny and suffered little aggravation before 9/11, the relatively greater change in treatment might thus be connected to the larger impact in their travel to the United States.

In sum, after taking into account economic and country-specific factors, the post-9/11 drop in entries was largest among travelers who did not need a visa. This indicates that changes in the formal visa process do not explain most of the decline in travel to the United States. What mattered instead were either changes in foreign attitudes or changes in the post-9/11 security regime that affected the decisions of all tourists and businesspersons considering travel to the United States, not just those required to obtain visas.

2 Border Security Policy

Airport security changed substantially following 9/11, with passengers arriving in the United States facing much greater scrutiny than before the attacks. Airlines are required to send passenger lists in advance, exclusions lists are more vigorously maintained (though still by no means error-free), and non-citizens are required to provide digital fingerprints and have their photograph taken on arrival. Visa approval takes longer.

State Department spokespersons have stated, however, that refusal rates did not change significantly in the wake of the attacks. Indeed, though the refusal rate reached 35.1 percent in fiscal year 2002 (following the attacks), the 31.7 percent rejection rate in fiscal year 2003 was

abroad are likely to differ markedly from influences on business and leisure travel decisions. Moreover, our data and methodology do not apply to students, who are generally not short-term visitors.

actually below the rate during fiscal 2001, the year ending in September 2001 (Clemens 2004).⁴ These slight variations in visa rejection rates explain only a small portion of the 17 percent drop in the total number of entries: the modestly higher rejection rate meant that several hundred thousand more visa applications were refused in the year after the attack than in the year before it, but the total number of entries fell by several million. Of course, it could be the case that potential visa applicants, aware of the increased scrutiny they receive in the post-9/11 world, self-select in a way that reduces the number of rejections made at U.S. diplomatic missions.

Even if the criteria for granting or rejecting a visa application have not changed much, potential travelers requiring a visa are still affected by changes in consular procedures and higher fees that make the visa process more arduous and expensive. Further, other security procedures affect all visitors, regardless of whether or not they need a visa, such as the heightened airport security and more involved screening for U.S.-bound flights that make travel less pleasant. Raising the cost of boarding a plane and obtaining a visa would be expected, on the margin, to discourage foreigners from undertaking business or leisure travel to the United States.

In response to the terrorist attacks, many changes were made impacting the ability of foreigners to obtain a visa. A Department of State report states that "the post-September 11, 2001 era witnessed immediate efforts to effect dramatic changes in CA's [Consular Affairs] direction of the visa process" (Office of the Inspector General, Department of State 2004). While some of these changes are easily identifiable and were implemented on a specific date, others have not been publicly disclosed or were implemented over time, including being applied differently in different regions.

⁴ These rates exclude some small visa categories, but the pattern remains essentially identical if these are added, rising through FY2002, but then falling in FY2003 to below pre-9/11 levels.

The most obvious change is that foreigners now pay more to apply for a visa to visit the United States, as visa fees rose from \$45 before September 11 to \$65 in June 2002 and to \$100 in November 2002 (Rose 2004). Further, the time it takes to get approved for a visa increased for many applicants. Shortly after the attacks, the Department of Justice requested that two new name check procedures be added to the visa application process, requiring 20 and 30 days each. The 30-day check under the so-called “Visa Condor” program applies to visa applicants from a list of countries that is classified for national security reasons (GAO 2002). In early 2002, American consulates began to collect a supplemental application form from male visa applicants aged 16 to 45 from every country. Visa applicants from certain countries must now undergo a face-to-face interview at a U.S. embassy or consulate to obtain a visa.

These changes in visa policy, however, do not impact visitors from all foreign countries because some visitors do not require a visa in the first place. The Immigration Reform and Control Act of 1986 created the Visa Waiver Program to facilitate the entry of temporary visitors from countries whose citizens were perceived as particularly unlikely to threaten U.S. national security. Under the program, foreign nationals from participating countries (listed in Table 1) are able to enter the United States for up to 90 days without obtaining a visa (all nations participating in the visa waiver program are required to extend reciprocal treatment to Americans). Visitors are still checked against an exclusion list and must provide proof of a return ticket out of the United States and adequate financial resources for their stay. A small number of visitors from visa-waiver countries are required to obtain non-immigrant visas (for example, travelers wishing to stay in the United States on a temporary basis for more than 90 days, visitors with criminal backgrounds, and anyone who was previously denied a visa), and occasionally foreigners unaware of their eligibility for the visa waiver program will unnecessarily apply for a visa. These travelers, however, account for less than 10 percent of the non-immigrant entries from most visa

waiver countries in recent years. Based on this, we assume in the regression analysis that all visitors from visa-waiver countries are without a visa, while all entrants who are citizens of countries not included in the visa waiver program require one.

Countries were added to the visa waiver program starting with the United Kingdom in 1986 and most recently with Portugal, Singapore, and Uruguay in 1999. The program was made permanent in 2000 and at that time included 29 countries (Table 1). Argentina and Uruguay were removed from the program in 2002 and 2003, respectively.

The visa waiver program has come under review in the wake of the 9/11 attacks and subsequent incidents, as concerns have arisen that terrorists or other criminals could exploit the program. After all, Zacarias Moussaoui, a French national convicted as a co-conspirator in the September 11 attacks and Richard Reid, a British citizen convicted of trying to detonate a bomb concealed in his shoes while on a flight to the United States, both entered the United States under the Visa Waiver Program. To date, however, the program has not been changed, though efforts to improve the list of foreign nationals ineligible for entry to the United States might be seen as an attempt to address the potential vulnerability.

3 Influences on Business and Leisure Travel

A change in visa policy was only one of several factors affecting foreign travel to the United States. The September 11 attacks had a significant impact in reducing airplane travel to the United States that was independent of security measures (one might term this a “psychological” impact in making people reluctant to fly in the immediate aftermath of the attacks). This is mirrored by the reduction in domestic U.S. air travel after 9/11: according to Air Transport Association data, the number of domestic passenger enplanements in the United States dropped 9 percent in fiscal 2002 compared with fiscal 2001, and fell a further 3 percent in fiscal 2003.

Economic factors affect travel as well. Strong U.S. growth would likely increase business opportunities for foreign businesspersons considering travel to the United States, while the strength or weakness of growth in travelers' home countries might affect business and leisure travel as well. Exchange rate fluctuations change the effective cost, denominated in foreign consumption units, for foreigners considering travel to the United States. Finally, the onset of the war in Iraq appears to have led to a drop-off in travel in early 2003 as potential visitors awaited the outcome of the conflict.

There has been limited research on the economic factors that influence business and leisure travel. The most closely related studies examine the determinants of total spending by international tourists, which of course equals the product of the number of visits (our focus) and the average amount spent on each visit. Rhomberg and Boissonneault (1964) and Gray (1966) estimate elasticities of demand for spending by international travelers with respect to national and per capita income and exchange rates and find that the response of spending to these factors is statistically different from zero. Gray also finds that the cost of transportation was not a significant factor influencing international travel, though of course this and the other results could well have changed in the intervening four decades. Kwack (1971) likewise shows that spending abroad by travelers responds substantially to changes in national incomes and real exchange rates and finds that these elasticities are higher for foreign travelers entering the United States than for U.S. travelers visiting foreign countries (though, again, these results apply to data from the 1960's). More recently, Di Matteo (1993) and Vilasuso and Menz (1998) find that national income and the exchange rate are the key determinants of spending by Canadians traveling in the United States.

An analytic framework to assess the influences on the number of business and pleasure travelers would model the choice of individuals of whether or not to travel to the United States,

with this binary (or possibly multinomial) decision influenced by personal circumstances, including both financial and otherwise. Since the requirement of individual-level data on potential travelers is unrealistic, we estimate instead using a macroeconomic framework in which the dependent variable is the monthly number of entries to the United States from individual countries of origin, and the explanatory variables are economic factors such as overall GDP growth in the United States and each partner nation and changes in the real exchange rate between the two countries. We also take into account influences on travel patterns such as the season in the United States (the hemisphere of the origin country turns out not to matter), the war in Iraq, and whether a traveler requires a visa to visit the United States.

The econometric analysis is carried out on a panel of entries into the United States from each of 65 countries, denoted as i . This is akin to using data on bilateral trade between the United States and various partners. Country fixed effects are included to capture country-specific factors, while monthly fixed effects capture seasonal factors. The specification includes a post-9/11 dummy variable, a dummy to indicate whether travelers from each country are eligible for the visa waiver program (VWP), and the interaction between the 9/11 and the visa waiver indicators. This allows for a “differences-in-differences” framework to assess whether post-9/11 changes affected entrants from VWP and non-VWP countries differently: all travelers to the United States were affected by the post-9/11 environment and by some changes in security procedures, but only travelers from non-VWP countries were affected by changes in visa rules. The empirical specification allows us to assess whether the impact on travel after 9/11 differed between travelers who needed a visa and those who did not.

4 Data and Specification

Monthly data on non-immigrant entries to the United States were obtained from the U.S. Department of Homeland Security (DHS). The data include I-94 admissions only, meaning it excludes the majority of short-term land-border admissions from Canada and Mexico. We follow DHS in focusing on these data because the large number of Canadian and Mexican entries would swamp non-immigration trends from the rest of the world that are more relevant to visa policy. Further, the motivating factors for crossing a land border may differ from the drivers of overseas travel.

These unpublished data are compiled by DHS's Office of Immigration Statistics and include the monthly number of entries for fiscal years 1996 and 1998 to 2003 (as an example, fiscal year 2003 runs from October 2002 to September 2003).⁵ There are some gaps in the data, with only annual figures available for 1995 and no data at all for 1997. We have not been able to obtain monthly data for years after 2003.

The data include the number of entries by class of admission (e.g. tourist or businessperson) and by country of citizenship.⁶ This last classification means that, for example, a French national arriving in the United States is counted as French regardless of whether he or she resides in France and regardless of the port of embarkation. There is a slight difference in the total numbers between the published data and those used in our analysis because our figures do not include certain classes of entries, including refugees, advance parolees, port of entry parolees, deferred inspection parolees, humanitarian parolees, public interest parolees, overseas parolees,

⁵ Most of these data have been aggregated into annual statistics and included in the Office of Immigration Statistics' *Yearbook of Immigration Statistics*, but the monthly statistics on country-by-country entries are not published separately (the unpublished data we use are from DHS Table 607).

⁶ The split between business and pleasure is not always available and in some cases is imputed, preventing us from further including these characteristics in our analysis.

withdrawals, and stowaways.⁷ These excluded groups, however, typically account for only about 1 percent of total entries to the United States.

The number of entries consistently trended upward from the early 1990s until September 2001. After the post-9/11 drop-off, travel to the United States slowly grew back to near its former peak. Non-immigrant travel had not reached its pre-9/11 level by the end of September 2005, the most recent year for which we have data (that is, DHS has published the total number of entries for fiscal years 2004 and 2005, but has not made available monthly data by country). The panel unit root test of Im, Pesaran, and Shin (2003) rejects the null of non-stationarity for both the levels and log of entries when all countries are pooled together for the years in which continuous data are available from October 1997 to September 2003 (the null is rejected with and without including a trend in the test). This could reflect the break as entries drop after the attacks. Since the data show an upward trend in visits before and after this break, we include linear and quadratic time trends to account for the ongoing increase in the number of potential travelers and reductions in the cost of travel not captured by our other variables. We further provide results for specifications with separate trends for visa waiver and non-visa waiver countries.

We drop countries lacking economic data such as at least quarterly measures of output and inflation. The resulting sample includes 65 countries and covers over 86 percent of all entries in fiscal year 2003. Our sample contains 23 countries that were participants at some point in the visa waiver program – a few countries move in or out of the visa waiver program during the

⁷ Figure 1 plots the aggregate figures from our analysis, rather than the slightly larger published numbers. Since our data excludes 1995, we generate a comparable annual number by maintaining the published 1994-1995 growth rate, but applying it to our slightly smaller 1994 values. The same procedure was used to generate the annual number of entries for 2004 and 2005, where we again have data on the growth of annual entries but not monthly data on entries from individual countries.

years in our sample (Argentina was removed, while Australia, Slovenia, Portugal, and Singapore were added).

Though neither Canada nor Mexico are in the visa waiver program, and most land-border entries from those countries are excluded from our I-94 data, it remains unclear how to classify other travelers from these countries whose entries are included, such as entries by Mexican or Canadian citizens who arrive from other countries rather than directly across the land border. Our baseline results groups Canada with the visa waiver countries and Mexico with the non-visa waiver countries, because short-term travelers flying into the United States from Canada generally do not need any type of visa, while those from Mexico generally do. In appendix Tables 3A and 4A, we present our regression results after dropping both of these countries from our dataset. Compared with our baseline dataset, some results are strengthened, while others are weakened. Overall, the decision to include the limited I-94 entries from Canada or Mexico but matters little for our primary conclusions.

The data indicate that the 9/11 attacks mattered greatly for travel to the United States. The total number of entries in the aggregate data from all 204 countries declined by more than 17 percent from the last full fiscal year before the attacks to fiscal 2003 (Figure 1). Table 2 shows the corresponding drop in entries from our 65 sample countries is also 17 percent, which reflects a decline in entries over this period from the sample's 23 visa waiver countries of 21.4 percent, and a drop in non-visa waiver countries of 4.1 percent.⁸

Our sample of countries includes a high percentage of total entries from visa waiver countries, which implies that the 21.4 percent drop in entries from these countries in our data is close to that in the aggregate data for all visa waiver countries (that is, including those not in our

⁸ Argentina was removed from the visa waiver program in between fiscal years 2000 and 2003 and so is excluded from both sets of countries in these calculations.

sample). Coupled with the facts that aggregate entries dropped 17.5 percent and that entries from visa waiver countries accounted for about 50-60 percent of all entries over this period, this implies that our subset of non-visa waiver countries is not completely representative. In our sample, entries from these countries drop 4.1 percent, but in the aggregate data the drop must be about 12 percent. Much of this discrepancy arises from the inclusion of Mexico in our sample, since the number of admissions from Mexico is quite large and did not drop after 9/11. Entries from the remaining non-visa waiver countries dropped 11 percent over the period, which is quite similar to what we calculate as the overall figure for the decline in entries from outside of the visa waiver program. As mentioned above, dropping Mexico entirely does little to alter our key results. As such, we view our dataset as largely representative of entries from both visa waiver and non-visa waiver countries.

The summary statistics in Table 2, both for the aggregate data as well as for the countries in our dataset, do not indicate that visa policies contributed substantially to the drop in entries; indeed, the raw numbers suggest the opposite in that the average decline was larger for entries from countries whose citizens did not require a visa. Hence, just from looking at these data, one might conclude that the reduction in business and pleasure travel resulted from the psychological or economic effects of the terrorist attacks that were common to all countries, or from general security measures impacting all travelers rather than from changes in visa policy. While the summary statistics suggest that the impact of visa policies on non-immigrant entries was limited, a multivariate regression framework is required to distinguish the influence of visa policies from economic and other factors impacting travel decisions.

Our base specification for entries from country i in month t takes the form:

$$\begin{aligned}
\text{Entries}_{it} = & \beta_1 \Delta \ln GDP_{it} + \beta_2 \Delta \ln RER_{it} + \beta_3 VWP_{it} + \beta_4 \text{Country}_i + \beta_5 \Delta \ln GDP_{U.S.,t} + \dots \\
& \dots + \beta_6 \text{Iraq}_t + \beta_7 \text{Post-9/11}_t + \beta_8 \text{Month}_t + \beta_9 \text{Trend}_t + \beta_{10} (VWP * \text{Post-9/11})_t + \varepsilon_{it}
\end{aligned} \tag{1}$$

Data on real GDP, inflation, and nominal exchange rates in terms of local currency per dollar are from the IMF's International Financial Statistics (IFS) database. The economic and indicator variables are at a monthly frequency; for real GDP, we linearly interpolated quarterly data to obtain monthly values.⁹ The real exchange rate, RER, is calculated using the nominal exchange rate (in foreign currency per dollar) and U.S. and foreign consumer price inflation; a larger value thus represents a real appreciation of the U.S. dollar. Real GDP growth and the real exchange rate are included as 12-month growth rates. The Iraq war indicator variable equals one for March and April 2003, the two months of the conflict in Iraq when major conventional fighting was underway.

Our baseline regression specification, the estimates for which are shown in Table 3, uses the number of entries as an integer, so that the estimated coefficients indicate the change in the number of monthly entries from an average country in response to the right hand side variables. These coefficients can then be multiplied by 65 (the number of countries) to obtain the total monthly impact.

We also consider specifications using the log of the number of entries. The coefficients from the log specifications, the results of which are in table 4, provide a readily interpreted elasticity such as that a 1 percentage point increase in U.S. growth is associated with a 1.4 percentage point increase in visits. Estimating with the log of entries is problematic, however, in that it gives the same weight in the regression to a 10 percent change in visits from a country with many travelers such as Japan as it does a 10 percent change in visits from a country with

relatively few entries such as Kazakhstan. We thus see the log specifications as providing sensitivity analysis and the levels estimates as the main empirical focus.

The post-9/11 indicator equals zero before the September 11 attacks and one thereafter, while the VWP variable is one for countries participating in the visa waiver program and zero otherwise. The coefficient on the interaction of the post-9/11 and VWP indicators measures the differential impact of 9/11 on people from visa waiver countries (who do not require a visa) compared to visitors who must obtain a visa (travelers from non-visa waiver countries). A significant positive value would indicate that, conditional on the economic factors and other controls, post-9/11 changes were associated with a larger reduction in entries from non-visa waiver countries than visa waiver countries. This would suggest that stricter visa policies that applied only to non-VWP entries affected travel.

In all of the regressions, we assume that the causality runs from macroeconomic variables of GDP growth and the exchange rate to the number of entries, and that the number of visits from any one country is not large enough to affect aggregate growth rates or currency markets. This is based on the observation that even the high water mark of roughly 3.5 million temporary visits in July 2000 (from all countries) is modest compared to the U.S. population or labor force, and that the spending of these visitors and thus their impact on the exchange value of the dollar is dwarfed by the trillions of dollars in daily turnover in foreign exchange markets.

5 Regression Results

Table 3 provides results from panel regressions on the influences of the number of entries to the United States, where the dependent variable is the number of entries. All specifications

⁹ The consumer price index for Australia is available only by quarters in some years and is linearly interpolated to obtain monthly values.

include country- and month- fixed effects, linear and quadratic trends, and standard errors are robust to heteroscedasticity and are clustered by country of citizenship to control for serial correlation within each country. We show results for specifications with common trends across all countries and with separate trends for the two groups of countries. As noted above, the coefficients indicate the response of the monthly number of visits from an average origin country; the total monthly impact on visits to the United States is thus calculated by multiplying the coefficient by 65, for the number of countries (and the annual impact found by multiplying again by 12).

The first column provides estimates for the baseline specification shown in equation (1). The second column reports the results when we allow for different time trends in the two groups of countries. In the third column, we add an additional dummy and interaction term for fiscal year 2003, thereby separating out the impact of the first and second years after 9/11 (the total for the second year is provided at the bottom of the table). Column four provides results with both differing time trends and a separate level effect for fiscal years 2002 and 2003.

The results indicate that stronger growth in the United States is associated with a substantial increase in inbound foreign travel: the coefficient of 604 in the baseline specification (column 1) means that a one percentage point increase in U.S. growth leads to 39,260 additional visits in a month from all 65 countries together (calculated as $604 \times 65 = 39,260$). This is a 2.4 percent increase compared to the 1.6 million monthly entries recorded in August 2000. In contrast, growth in the origin country has no impact on travel to the United States, with coefficients that are statistically indistinguishable from zero.

The coefficients on the real exchange rate are uniformly negative as expected, implying that a stronger dollar (a real depreciation of the currency of the origin country) leads to less travel to the United States. This is in line with the expectation that a weaker currency in the origin

country makes travel to the United States (an import of U.S. services) and the dollar-denominated fee to apply for a visa more expensive for foreigners. The precision of the estimates is only moderate, however, with all of the coefficients statistically significant at the 10 percent level.

As expected, we find a decline in arrivals to the United States during the two months of major combat in Iraq in 2003, with the coefficient statistically significant in all specifications. In results not shown in the tables, we find that including a hemisphere indicator interacted with the monthly dummies does not qualitatively affect the results. This suggests that what matters is the season (that is, the month) in the United States rather than the season in the origin country.

The coefficients on the indicator variables for participation in the visa waiver program, for the time period after 9/11, and for the interaction of the visa waiver and post-9/11 period reveal several results. Before 9/11, participation in the visa waiver program does not have a statistically significant impact in terms of the number of short-term travelers to the United States compared with non-visa waiver countries (the inclusion of the interaction of the 9/11 and visa-waiver indicator variables mean that the coefficients of 3,021 and so on in the second row of results are for the pre-9/11 period).

The coefficients on the 9/11 indicator by itself captures the change in entries from nations whose travelers require a visa. The negative coefficients in all four specifications show the expected result that after conditioning on economic and country-specific fixed effects, the change in circumstances following the 9/11 attacks was associated with a decline in travel to the United States. This result is quantitatively similar across regressions, but statistically significant in only the specifications with a common time trend (columns 1 and 3). For these specifications, total entries decline by an average of 230,035 in column (1) and 204,555 visits in column (3) (65 countries multiplied by the coefficients of 3,539 and 3,147, respectively), not quite a 15 percent

decline from the 1.6 million monthly visits before 9/11. Allowing for separate trends for the two groups of countries and splitting up the two years after 9/11 results in quantitatively similar but not statistically significant coefficients for the impact of 9/11 on entries from non-visa waiver countries.

The interaction of the 9/11 indicator with the visa waiver program indicator is the “differences-in-differences” parameter that shows the differential impact of 9/11 on entries from the visa waiver countries compared to non-visa waiver countries. If changes in visa policy were a significant factor in reducing travel to the United States after 9/11, then this coefficient should be positive and statistically significant. This is because a positive interaction would indicate that the differential impact after 9/11 was more favorable for travelers not needing a visa than for people who needed a visa and were thus affected by changes in visa policy. The results, however, show the opposite, with the coefficients on the interaction between the post-9/11 indicator and the visa waiver indicator (which includes Canada) negative in all four of specifications, and statistically significant in the two specifications with a common trend. The finding that the number of entrants needing a visa declined by more than the number of entrants who did not require a visa contradicts the contention that stricter visa policy accounts for the fall in post-9/11 travel to the United States, since the visa changes affected only travelers from countries not in the visa waiver program.

Columns 3 and 4 show specifications in which the post-9/11 effect is estimated separately for 2002 and 2003 (again, following the way the data are reported, these are fiscal years, from October 2001 to September 2002 and then October 2002 to September 2003). These results shed some light on the dynamics of the drop in entries after September 11. Short-term travel to the United States remained depressed in the second year after the attacks, but the drop was somewhat diminished in this second year for visitors from visa waiver countries (that is, not requiring

visas). This is seen in the positive coefficient on the interaction of the dummy variable for 2003 with the dummy variable for the visa waiver program (plus Canada). This interaction is statistically significant or nearly so in both columns 3 and 4 (with common or separate trends for the two groups of countries). It remains the case, however, that the dominant effect is the much larger decline in travel by people not requiring visas in the year immediately following the attacks. The combinations of coefficients at the bottom of the table show that average monthly entries in 2003 fell by twice as much (coefficients of -16,697 and -15,222) among people not needing a visa than for travel by people needing a visa (coefficients of -4,599 and -5,473), though this difference (the second to last line in the table) is not itself statistically significant. These results corroborate the baseline results in column (1) that rule out a large role for changes in visa policy in accounting for the decline in post-9/11 visitors.

Estimates of the log specification (Table 4) broadly suggest as well that there is not statistical support for the assertion that changes in visa policy account for the decline in post-9/11 travelers to the United States. This is the implication of the regression results that the difference-in-difference parameter of the interaction of the visa waiver and post-9/11 dummies is either negative or not statistically significant when positive. As noted above, it should be kept in mind that the log specifications have the problematic property that they give the same weight to a given percentage change in arrivals from countries such as Germany or France with many visitors as to a percentage change in arrivals from countries with few travelers to the United States (a few dozen additional travelers from Kazakhstan can thus have the impact of many more from Germany). These estimates should thus be seen as sensitivity analysis.

The log specifications in Table 4 show that entries fall from all countries in the wake of 9/11: the negative coefficient on the post-9/11 dummy by itself indicates the impact on travelers requiring a visa, while the sum of coefficient on the post-9/11 dummy and the coefficient of its

interaction with the visa waiver indicator show the impact on travelers who do not need a visa (this latter sum is calculated in the first row of combination of the estimated coefficients at the bottom of the table and is significant and negative in all specifications). Treating the post-attack period as a single time (columns 1 and 2), the decline equals 24.1 and 30.0 percent for non-visa waiver countries and 34.3 to 25.2 percent for people not required to obtain a visa. The interaction of the visa waiver dummy and the post-9/11 dummy is not statistically significant and positive in any of the four specifications (though nearly so in the column 4 with separate trends and separate impacts for 2002 and 2003). This accords with the results from the specifications in levels that post-9/11 changes are not associated with a larger decline in entries for people requiring a visa than for travelers who do not need one.

Considering 2002 and 2003 separately (columns 3 and 4) shows that entries for travelers not needing a visa fell by 38.7 percent or 23.1 percent in 2002, and then recovered somewhat to a drop of 37.2 or 12.8 percent in 2003. In contrast, entries declined further for travelers needing a visa, though the initial decline is still the largest movement in the column 3.

The other coefficients in the log specifications are broadly sensible. The months of the Iraq war saw about a 20 percent decline in entries. Growth in the origin country is positively associated with travel to the United States in the log specifications, and growth in the United States is likewise associated with more entries. And as in the levels specifications, the real exchange rate has the expected negative coefficient, broadly statistically significant, that a stronger dollar is associated with less travel to the United States.

6 Conclusion

We find that the decline in visits from countries requiring a visa was not larger than the decline in entries from countries exempt from visa requirements. This suggests that tighter visa

policy was not the cause of the sharp drop in business and leisure travel to the United States in the wake of the 9/11 attacks.

Changes in the visa process enacted with a delay after 9/11 could be connected with the complaints voiced about visa problems and these changes perhaps reduced entries somewhat from countries outside the visa waiver program. The timing of this impact, however, does not correspond with the immediate drop in entries, nor does its magnitude stand out when compared with the impact of changes unrelated to visa policy.

It is difficult to say for sure why the travel plans of people who did not require a visa to visit the United States were affected more (or, at least, not less) after 9/11 than travel by people needing to get a visa. One explanation would be that people in the visa waiver countries simply desired to travel less after the attacks. An alternative explanation for the larger drop in visitors who do not require visas might be connected to the increase in non-monetary costs, such as waiting times and other aggravations associated with increased security involved in traveling to the United States. Before 9/11, short-term visits to the United States were nearly hassle-free for citizens of countries participating in the visa waiver program. In contrast, nationals of other countries, mainly less-developed ones, faced the hazards of the visa application process. After 9/11, visa applicants might well have thought that they were receiving greater scrutiny, and indeed, some of them had to wait longer for visas and travel further for an in-person interview at a U.S. diplomatic post. What they could not see, however, was that travelers who did not require a visa were also facing new costs—that is, new hassles—to enter as a result of post-9/11 changes in security. Compared to the previous near-zero amount of hassle, the added aggravation for travelers from “trusted” countries was proportionately enormous. While changes in visa policy might have affected travelers needing them, this appears to have been a secondary factor in accounting for the overall decline in short-term business and tourist travel to the United States.

Future research could shed light on the causes of the steep reduction in temporary entries of businesspersons and tourists to the United States after the 9/11 attacks. The results in this paper, however, lead us to dismiss the broadly subscribed to hypothesis that changes in visa policy are primarily to blame.

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Table 1: Participation in the Visa Waiver Program

	Country	Date of Inclusion		Date of Removal	
		Month	Year	Month	Year
(1)	United Kingdom	July	1988		
(2)	Japan	December	1988		
(3)	France	July	1989		
(4)	Switzerland	July	1989		
(5)	Germany	July	1989		
(6)	Sweden	July	1989		
(7)	Italy	July	1989		
(8)	Netherlands	July	1989		
(9)	Andorra	October	1991		
(10)	Austria	October	1991		
(11)	Belgium	October	1991		
(12)	Denmark	October	1991		
(13)	Finland	October	1991		
(14)	Iceland	October	1991		
(15)	Lichtenstein	October	1991		
(16)	Luxembourg	October	1991		
(17)	Monaco	October	1991		
(18)	New Zealand	October	1991		
(19)	Norway	October	1991		
(20)	San Marino	October	1991		
(21)	Spain	October	1991		
(22)	Brunei	July	1993		
(23)	Ireland	April	1995		
(24)	Argentina	July	1996	February	2002
(25)	Australia	July	1996		
(26)	Slovenia	September	1997		
(27)	Portugal	August	1999		
(28)	Singapore	August	1999		
(29)	Uruguay	August	1999	April	2003

Table 2: Summary Statistics of Non-immigrant Entries in the Sample

		Number of Countries	Number of Non-Immigrant Entries		Decline
			Fiscal Year 2000	Fiscal Year 2003	
Aggregate Data		204	33,892,772	27,965,816	-17%
Full Sample		65	28,953,128	24,158,712	-17%
Visa-Waiver Eligible and Canada		23	19,156,318	15,049,517	-21%
(1)	Australia		593,246	552,916	-7%
(2)	Austria		213,384	131,340	-38%
(3)	Belgium		258,904	179,559	-31%
(4)	Canada		260,086	243,755	-6%
(5)	Denmark		178,349	163,408	-8%
(6)	Finland		118,369	86,742	-27%
(7)	France		1,329,169	1,040,949	-22%
(8)	Germany		2,146,442	1,444,665	-33%
(9)	Iceland		31,803	25,229	-21%
(10)	Ireland		405,583	372,137	-8%
(11)	Italy		810,613	641,216	-21%
(12)	Japan		5,259,703	3,593,469	-32%
(13)	Luxembourg		12,913	7,640	-41%
(14)	Netherlands		684,041	546,191	-20%
(15)	New Zealand		200,147	204,219	2%
(16)	Norway		166,300	142,935	-14%
(17)	Portugal		114,701	84,436	-26%
(18)	Singapore		119,632	81,919	-32%
(19)	Slovenia		18,035	11,732	-35%
(20)	Spain		466,168	430,070	-8%
(21)	Sweden		377,000	257,899	-32%
(22)	Switzerland		390,237	257,898	-34%
(23)	United Kingdom		5,001,493	4,549,193	-9%
Non Visa-Waiver Eligible		41	9,248,012	8,864,718	-4%
(1)	Belize		30,859	26,587	-14%
(2)	Botswana		2,392	1,945	-19%
(3)	Chile		211,738	140,553	-34%
(4)	Colombia		478,142	389,768	-18%
(5)	Costa Rica		173,112	149,998	-13%
(6)	Croatia		24,925	19,960	-20%
(7)	Cyprus		13,345	9,554	-28%
(8)	Czech Republic		52,910	44,478	-16%
(9)	Ecuador		138,661	163,531	18%
(10)	Estonia		8,856	8,758	-1%
(11)	Greece		79,359	60,083	-24%
(12)	Georgia		4,869	5,290	9%
(13)	Guatemala		183,162	189,989	4%
(14)	Hong Kong		129,401	75,780	-41%
(15)	Hungary		68,696	45,020	-34%
(16)	India		560,110	559,805	0%
(17)	Indonesia		97,249	65,071	-33%
(18)	Iran		28,425	10,398	-63%
(19)	Israel		357,644	307,101	-14%
(20)	Jamaica		277,895	224,478	-19%
(21)	Jordan		30,631	21,214	-31%
(22)	Korea		811,951	845,272	4%
(23)	Kyrgyzstan		2,000	1,668	-17%
(24)	Latvia		11,733	10,494	-11%
(25)	Lithuania		13,747	15,811	15%
(26)	Macau		1,439	937	-35%
(27)	Malaysia		95,709	53,160	-44%
(28)	Malta		9,112	5,790	-36%
(29)	Mauritius		3,028	1,415	-53%
(30)	Mexico		4,204,357	4,358,142	4%
(31)	Morocco		27,590	18,021	-35%
(32)	Peru		229,307	224,542	-2%
(33)	Philippines		281,463	273,439	-3%
(34)	Poland		147,125	155,810	6%
(35)	Romania		44,162	49,722	13%
(36)	Slovak Republic		20,933	24,629	18%
(37)	South Africa		132,818	108,232	-19%
(38)	Sri Lanka		17,656	13,846	-22%
(39)	Thailand		97,560	74,195	-24%
(40)	Tunisia		12,885	4,181	-68%
(41)	Turkey		131,056	106,051	-19%
Mixed (VWP in FY2000, not in FY2003)		1			
(1)	Argentina		548,798	244,477	-55%

Table 3: Levels Estimation—Number of Entries to the United States

	Post-9/11 impact treated as one period		Post-9/11 impact split into first and second years	
Post-9/11	-3,539 (-2.23)	-2,971 (-1.58)	-3,147 (-2.10)	-3,433 (-1.80)
Visa Waiver	3,021 (0.67)	-1,355 (-0.09)	3,013 (0.67)	-5,244 (-0.32)
Post-9/11 x Visa Waiver program	-13,366 (-2.04)	-14,810 (-1.78)	-14,625 (-2.24)	-13,906 (-1.66)
2003			-1,452 (-1.69)	-2,040 (-2.10)
2003 x Visa Waiver program			2,528 (1.94)	4,158 (2.21)
Iraq war	-4,846 (-2.58)	-4,837 (-2.58)	-4,704 (-2.54)	-4,704 (-2.54)
Home country GDP growth	43 (0.34)	39 (0.31)	53 (0.41)	34 (0.27)
USA GDP Growth	604 (2.33)	606 (2.38)	663 (3.08)	663 (3.08)
Real exchange rate growth	-102 (-1.71)	-102 (-1.71)	-101 (-1.68)	-100 (-1.69)
Time trend	Common Quadratic	Separate Quadratic	Common Quadratic	Separate Quadratic
Combinations of estimated coefficients				
Post-9/11 (2002) change for VWP	-16,905 (-2.44)	-21,282 (-2.44)	-17,773 (-2.54)	-17,339 (-2.18)
2003 total impact for VWP			-16,697 (-2.37)	-15,222 (-1.85)
2003 total impact for non-VWP			-4,599 (-2.14)	-5,473 (-2.33)
2003 for VWP vs. non-VWP			-12,098 (-1.82)	-9,748 (-1.11)

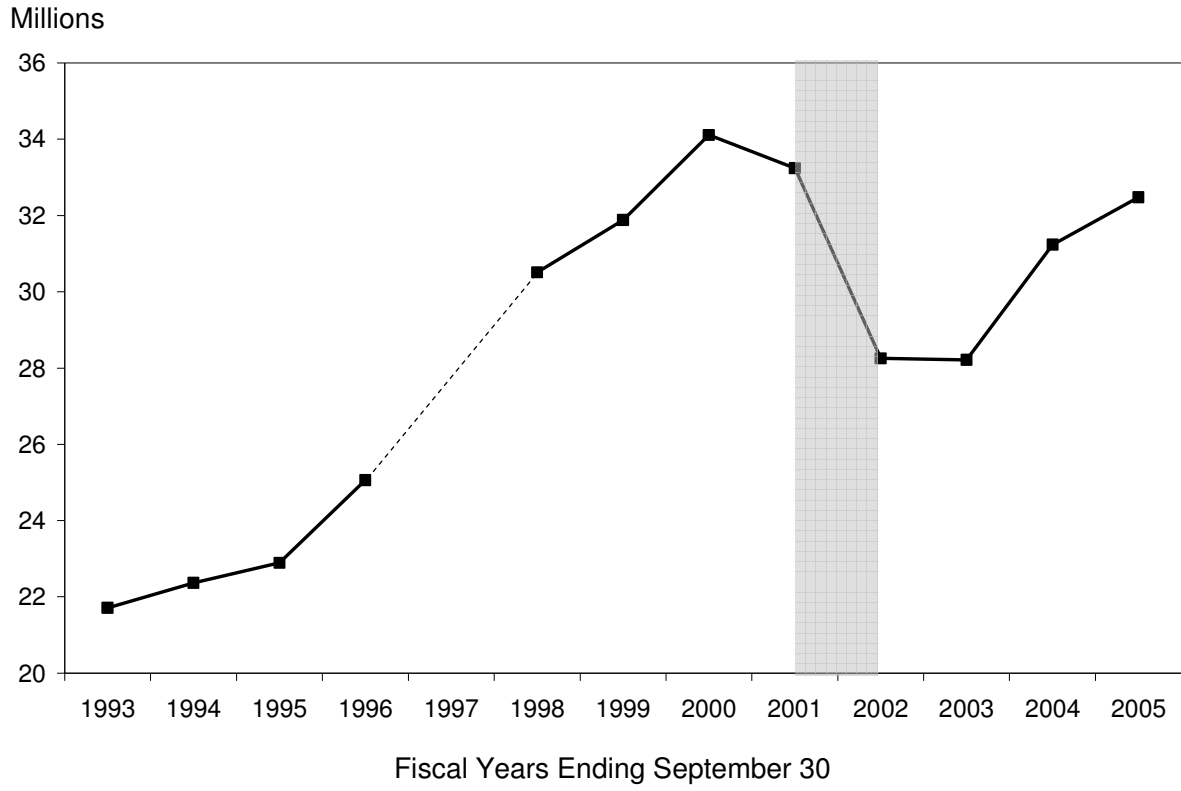
Data include 4856 observations for 65 countries from October 1995 to September 1996 and from October 1997 to September 2003 (with missing observations for October 1996 to September 1997). Standard errors are robust to general heteroskedasticity and are clustered by country to account for serial correlation.

Table 4: Log Estimation—Log of Entries to the United States

	Post-9/11 impact treated as one period		Post-9/11 impact split into first and second years	
Post-9/11	-0.241 (-6.31)	-0.300 (-7.68)	-0.230 (-5.14)	-0.333 (-7.16)
Visa Waiver	0.447 (1.30)	0.774 (1.77)	0.446 (1.29)	0.538 (1.21)
Post-9/11 x Visa Waiver program	-0.103 (-1.80)	0.047 (0.91)	-0.157 (-2.65)	0.102 (1.85)
2003			-0.092 (-2.54)	-0.149 (-3.13)
2003 x Visa Waiver program			0.108 (4.01)	0.251 (5.33)
Iraq war	-0.208 (-11.51)	-0.209 (-11.47)	-0.195 (-11.85)	-0.195 (-11.81)
Home country GDP growth	0.973 (3.90)	0.982 (3.79)	1.007 (4.00)	0.945 (3.68)
USA GDP Growth	1.145 (1.50)	1.126 (1.49)	1.763 (3.87)	1.775 (3.87)
Real exchange rate growth	-0.165 (-2.11)	-0.166 (-2.12)	-0.161 (-2.01)	-0.156 (-1.92)
Time trend	Common Quadratic	Separate Quadratic	Common Quadratic	Separate Quadratic
Combinations of estimated coefficients				
Post-9/11 (2002) change for VWP	-0.343 (-9.21)	-0.252 (-9.50)	-0.387 (-9.22)	-0.231 (-8.99)
2003 total impact for VWP			-0.372 (-5.60)	-0.128 (-3.04)
2003 total impact for non-VWP			-0.323 (-4.47)	-0.482 (-5.48)
2003 for VWP vs. non-VWP			-0.049 (-0.85)	0.354 (4.10)

Data include 4,856 observations for 65 countries from October 1995 to September 1996 and from October 1997 to September 2003 (with missing observations for October 1996 to September 1997). Standard errors are robust to general heteroskedasticity and are clustered by country to account for serial correlation.

Figure 1: Annual Non-Immigrant Entries



**Table 3A: Levels Estimation—Number of Entries to the United States
(Canada and Mexico both Excluded from Analysis)**

	Post-9/11 impact treated as one period		Post-9/11 impact split into first and second years	
Post-9/11	-3,564 (-2.18)	-1,362 (-1.42)	-3,131 (-2.05)	-1,891 (-1.73)
Visa Waiver	5,816 (1.65)	-11,959 (-0.95)	5,800 (1.64)	-16,069 (-1.20)
Post-9/11 x Visa Waiver program	-12,120 (-1.87)	-17,757 (-2.13)	-13,676 (-2.09)	-16,803 (-2.01)
2003			-1,985 (-2.92)	-2,335 (-2.62)
2003 x Visa Waiver program			3,116 (2.54)	4,362 (2.30)
Iraq war	-4,235 (-2.30)	-4,193 (-2.30)	-4,009 (-2.25)	-4,002 (-2.26)
Home country GDP growth	23 (0.18)	9 (0.07)	34 (0.27)	3 (0.02)
USA GDP Growth	46 (2.15)	47 (2.22)	560 (2.99)	557 (3.01)
Real exchange rate growth	-82 (-1.47)	-81 (-1.51)	-81 (-1.45)	-79 (-1.47)
Time trend	Common Quadratic	Separate Quadratic	Common Quadratic	Separate Quadratic
Combinations of estimated coefficients				
Post-9/11 (2002) change for VWP	-15,684 (-2.25)	-19,119 (-2.32)	-16,807 (-2.37)	-18,694 (-2.26)
2003 total impact for VWP			-15,676 (-2.19)	-16,667 (-1.95)
2003 total impact for non-VWP			-5,117 (-2.42)	-4,226 (-2.26)
2003 for VWP vs. non-VWP			-10,560 (-1.63)	-12,441 (-1.42)

Data include 4688 observations for 63 countries from October 1995 to September 1996 and from October 1997 to September 2003 (with missing observations for October 1996 to September 1997). Standard errors are robust to general heteroskedasticity and are clustered by country to account for serial correlation.

**Table 4A: Log Estimation—Log of Entries to the United States
(Canada and Mexico both Excluded from Analysis)**

	Post-9/11 impact treated as one period		Post-9/11 impact split into first and second years	
Post-9/11	-0.243 (-6.38)	-0.305 (-7.65)	-0.233 (-5.15)	-0.341 (-7.17)
Visa Waiver	0.466 (1.36)	0.812 (1.87)	0.465 (1.29)	0.561 (1.26)
Post-9/11 x Visa Waiver program	-0.111 (-2.05)	0.049 (0.91)	-0.168 (-2.97)	0.107 (1.88)
2003			-0.099 (-2.67)	-0.159 (-3.29)
2003 x Visa Waiver program			0.113 (4.10)	0.266 (5.61)
Iraq war	-0.213 (-11.66)	-0.215 (-11.63)	-0.199 (-11.88)	-0.199 (-11.84)
Home country GDP growth	0.963 (3.82)	0.967 (3.67)	0.997 (3.91)	0.924 (3.54)
USA GDP Growth	1.112 (1.41)	1.091 (1.41)	1.793 (3.86)	1.805 (3.85)
Real exchange rate growth	-0.168 (-2.20)	-0.170 (-2.22)	-0.165 (-2.11)	-0.160 (-2.01)
Time trend	Common Quadratic	Separate Quadratic	Common Quadratic	Separate Quadratic
Combinations of estimated coefficients				
Post-9/11 (2002) change for VWP	-0.354 (-9.73)	-0.256 (-9.29)	-0.400 (-9.60)	-0.234 (-8.71)
2003 total impact for VWP			-0.386 (-5.66)	-0.126 (-2.89)
2003 total impact for non-VWP			-0.332 (-4.53)	-0.500 (-5.58)
2003 for VWP vs. non-VWP			-0.055 (-0.99)	0.373 (4.24)

Data include 4688 observations for 63 countries from October 1995 to September 1996 and from October 1997 to September 2003 (with missing observations for October 1996 to September 1997). Standard errors are robust to general heteroskedasticity and are clustered by country to account for serial correlation.