

**Discriminatory Product Differentiation:  
The Case of Israel's Omission from Airline Route Maps**

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### **ABSTRACT**

While product differentiation is generally benign, it can be employed to discriminate against customer groups, either to enhance profitability by appealing to discriminatory customers or in unprofitable ways that indulge owners' tastes for discrimination. We explore discriminatory product differentiation by international airlines through their depictions of Israel on online route maps and whether their online inflight menus include kosher meal options. We first show that several airlines omit Israel from their online route maps. Three of these airlines are members of major international airline alliances. With data on over 100 airlines, we then document that online route map "denial" of Israel's existence is more likely for airlines with likely customers from countries exhibiting greater anti-Semitism. Likely owner tastes also matter: denial is more likely for state-owned airlines in countries that do not recognize Israel. Availability of kosher meal options follows similar patterns, suggesting anti-Semitic rather than anti-Zionist motivations. Neither online route map treatment nor ownership by states not recognizing Israel affects the likelihood of alliance membership with alliance leaders having few airline alternatives to choose from in the Middle East. (180 words)

Keywords: customer discrimination, product differentiation, airlines, alliances

## 1. INTRODUCTION

A firm seeking *not* to serve a group of customers has two broad strategies at its disposal. First, the firm can treat different consumers differently. Denny's restaurants used that approach in the 1990s when it required African-American customers to pay in advance or sometimes closed its restaurants when "too many blacks were present," leading to a lawsuit and a \$54 million settlement in 1994.<sup>1</sup> Product differentiation provides an alternative –and self-selecting, rather than explicitly discriminatory– way for a firm to avoid serving certain customers.<sup>2</sup> Because product preferences differ across customers, product differentiation can be a means for appealing to –and favoring– some customers over others. While product differentiation is generally benign, product differentiation can be employed to discourage patronage by customers that an owner prefers not to serve.

One rationale is simply the pursuit of profit: locating a store selling expensive products in a poor neighborhood might not generate enough revenue to cover costs.<sup>3</sup> A second profit-related rationale operates through potentially discriminatory preferences of customers, as discussed by Gary S. Becker (1957). A majority of customers might dislike patronizing establishments patronized by members of another group such as an ethnic minority. In that circumstance, product differentiation that discourages minority-group patronage might serve an otherwise non-discriminatory owner's desire to generate profits. There is a third rationale: even

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<sup>1</sup>Information on Denny's discriminatory practices and lawsuit is available here:  
<http://www.nytimes.com/1994/05/27/opinion/on-denny-s-menu-discrimination.html>; and  
<http://www.nytimes.com/1994/05/25/us/denny-s-restaurants-to-pay-54-million-in-race-bias-suits.html?pagewanted=all>. Discriminatory customer treatment arises in other commercial contexts such as mortgage lending (Ross and Yinger, 2002).

<sup>2</sup>The distinction between discrimination and self-selection recalls the theory of price discrimination (Stole, 2007).

<sup>3</sup>For example, private hospitals avoid locating in low-income areas (Norton and Staiger, 1994) to avoid a service obligation to non-paying patients.

when serving members of some group is both directly profitable and does not alienate other customers, an owner might prefer not to serve them. In Becker's (1957) terms, the owner might have a taste for discrimination, a willingness to sacrifice some revenue and profit in order not to serve certain customers.

We can rephrase the last two rationales for what we call discriminatory product differentiation in terms of our study's context. Many international airlines omit Israel from their online route maps, even as they identify essentially every other country in the world. Omission could follow from the anti-Israel preferences of customers, from the anti-Israel tastes of airline owners, or from both. The objectionable nature of such omission is arguably self-evident. It is also a risky business decision as the experience of atlas publisher HarperCollins demonstrates. In early 2015 UK-based Catholic newspaper *The Tablet* reported that a HarperCollins atlas "developed specifically for schools in the Middle East" omitted Israel, instead depicting Middle East geography as in Figure 1. The publisher noted that "including Israel in the Middle East Atlas would have been 'unacceptable' to its customers in the Gulf and instead adapted it to 'local preferences'."<sup>4</sup> When the atlas' omission of Israel came to light, the publisher retreated, apologized, and destroyed all remaining copies.<sup>5</sup>

The omission of Israel from the atlas proved costly to HarperCollins, which promoted what one observer described as "the figurative eradication of one of the most politically charged nations in the world" threatening "the real-world existence of the state of Israel."<sup>6</sup> Firms engaging in such behavior run the risk of negative publicity detrimental to business performance.

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<sup>4</sup> See <http://www.thetablet.co.uk/news/1579/0/harpercollins-pulps-school-atlas-that-omits-israel->.

<sup>5</sup> See <https://www.washingtonpost.com/news/morning-mix/wp/2015/01/02/harpercollins-omits-israel-from-maps-for-mideast-schools-citing-local-preferences/>.

<sup>6</sup> See <http://www.thedailybeast.com/articles/2015/01/11/why-harper-collins-wiped-israel-off-the-map.html> .

That risk merits investigation regarding why firms like HarperCollins and the international airlines we study below decide to engage in discriminatory product differentiation.

-----Insert Figure 1 approximately here-----

Our investigation begins by documenting different ways that international airlines depict Israel on online route maps. Most “embrace” Israel by depicting it by name with all other named countries. Several others “avoid” Israel by omitting all country names. A handful “deny” Israel’s existence by omitting only that country’s name or only that country’s name along with a few others. Most embracer, avoider and denier online route maps bear the Google logo. We establish these and other facts about airline online route map treatment of Israel, and then answer three questions. First, we ask why some online route maps omit Israel. Such discriminatory product differentiation may cater to customer preferences, owner tastes or both. Second, we ask whether online route map omission reflects anti-Zionism or anti-Semitism. To answer that question, we compare determinants of online route map depiction of Israel with determinants of online inflight menus that do or do not include kosher meal options relevant to Jews generally rather than just Israelis. This related aspect of discriminatory product differentiation may also cater to customer preferences, owner tastes or both. Third, we ask whether discriminatory product differentiation related to online route map treatment of Israel and online inflight menu kosher meal options affects the likelihood of membership in airline alliances including prominent US carriers: the Star alliance including United Airlines, the OneWorld alliance including American Airlines, and the SkyTeam alliance including Delta Airlines. Here we gain insight on the significance of discriminatory customer preferences and owner tastes for alliance members that include prominent US carriers touting their own opposition to discrimination.

To answer these questions, we assemble a database of international airlines, for which we collect information on three outcomes: how their online route maps treat Israel, whether their online inflight menus include kosher meal options, and whether they are members of the Star, OneWorld or SkyTeam alliances. We link these outcomes to novel data on likely airline customer preferences related to anti-Semitism and likely airline owner tastes related to state ownership and non-recognition of Israel. We develop a measure of each airline's likely customer anti-Semitism derived from Google searches of airline names by country, along with the same country's Anti-Defamation League (ADL) measure of anti-Semitism. We develop a related measure of each airline's likely customer interest in kosher meals based on Google searches of the term "kosher" by country and airline.

We find that both anti-Semitic preferences of likely international airline customers and state ownership by countries not recognizing Israel decrease the likelihood of Israel's presence on online route maps. We also find evidence that likely customer kosher interest increases but state ownership by countries not recognizing Israel decreases the likelihood of online inflight menu kosher meal options. This second set of results suggests that discriminatory product differentiation has anti-Semitic rather than just anti-Zionist motivations. Finally, we find that the likelihood of alliance membership increases with airline size, but neither increases when an airline "embraces" Israel by including it on online route maps nor decreases when an airline is state owned by a country not recognizing Israel. A review of potential alliance partners in the Middle East highlights the limited options available to US carriers that might otherwise seek Middle East airlines with less repugnant customer preferences and owner tastes.

To elaborate on these points, our study proceeds in five sections after this introduction. Section 2 describes various modes by which international airline online route maps depict Israel.

The online route maps are themselves interesting and also describe important data for later empirical investigation. Section 3 summarizes relevant scholarly literature related to our discriminatory product differentiation concept, and lays the theoretical foundation for our proposition that discriminatory product differentiation by firms reflects their customer preferences and owner tastes. Section 4 provides detailed discussion of data sources, sampling and tests employed to investigate empirical support for our proposition with international airlines. Section 5 reports test results from bivariate and multivariate analyses of our data. Section 6 concludes with a review of key findings and discussion of possible remedies for the discriminatory product differentiation certain airlines engage in and others, including prominent US carriers, accommodate.

## **2. EMPIRICAL CONTEXT**

International airlines typically present online route maps using one of four modes.<sup>7</sup> The first and most common online route map mode presents routes connecting destination cities within named countries. Many of the largest airlines in the world present their online routes maps bearing a Google logo and listing the name of every country in the world, including Israel. Figure 2 shows Air Canada's online route map centered, for illustration, on the Middle East. All country names in the region appear, as does a Google logo in the lower left-hand corner. Figure 3 shows a standard Google map for the same region, again with country names and Google logo. We find online route maps of this same mode for many other large international airlines from North America, Europe and Asia –for example, US-based Delta Airlines, Germany's Lufthansa, Air

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<sup>7</sup>Images of online route maps for all international airlines with service to Middle East destinations during the first quarter of 2016 are available from the authors.

China, and Japan Air Lines. Online route maps for these airlines acknowledge all country names to customers searching for flights.

-----Insert Figures 2-3 side by side approximately here-----

A second online route map mode used by international airlines lists city but not country names. It generally includes only cities served by the airline. A variant on this second mode includes symbols for destination cities but not country names. Figure 4 illustrates this second mode with the online route map for Royal Jordanian Airlines. Destination cities, such as Amman, Doha, and Tel Aviv, are depicted as red dots. Country names are omitted. Figure 5 shows the online route map covering Africa for El Al Israel Airlines. Again, countries are not named, but destination cities like Cairo, Johannesburg, and Tel Aviv are. City names are also omitted from the online route map if the airline does not serve any of a country's cities. With this second online route map mode, airlines effectively avoid having to acknowledge country names. Middle East-based airlines are not alone in using this second route map mode. Australia's Qantas Airways and Icelandair also list cities but not country names.

-----Insert Figures 4-5 side by side approximately here-----

Two international airlines use a third online route map mode that names countries with a few exceptions, including Israel. Both airlines are from the United Arab Emirates: Emirates is in Dubai, and Etihad Airways is in Abu Dhabi. In Figure 6, the online route map for Etihad does not name Israel, but it also omits the names of other countries, such as North Korea, Taiwan and some countries in Sub-Saharan Africa. Not all unserved country names are omitted from the Emirates online route. For example, Mali is named but Etihad does not list any flights to that country. The online route map for Emirates omits Israel along with North Korea and Taiwan.

The Etihad and Emirates maps both bear Google logos. These airlines selectively acknowledge country names for customers searching for flights. Israel is omitted, but since that omission is bundled with other country omissions, Israel is not uniquely singled out.

-----Insert Figure 6 approximately here-----

A fourth online route map mode names all countries *except* Israel. International airlines using this fourth mode are based only in the Middle East. They include UAE-based Flydubai, Kuwait Airways, Lebanon-based Middle East Airlines, Qatar Airways, and Saudia Arabia's Saudia Airlines. Figure 7 depicts the Saudia online route map covering Europe, Africa, the Middle East and much of Asia. Like other online route maps in this group, the Saudia route map includes Taiwan, North Korea, and other visible countries, but does not name Israel. By labelling all countries other than Israel, Saudia and other airlines using this fourth mode evince a clear intent to deny Israel's existence figuratively, which is consistent with Saudi Arabia's non-recognition of Israel diplomatically. Saudia's map bears the Google logo, as do online route maps of other international airlines using this fourth mode. Three airlines using this fourth online route map mode are also members of alliances including prominent US carriers: Qatar Airways is part of the OneWorld alliance including American Airlines; Middle East Airlines and Saudia are both part of the SkyTeam alliance including Delta Airlines.

-----Insert Figure 7 approximately here-----

Based on these map modes, we can divide international airlines with service to the Middle East into four groups according to their online route map treatment of Israel. We classify an international airline as an Israel *embracer* when its online route map names all countries including Israel. We classify an airline as an Israel *avoider* when its online route map does not

name any countries it flies to including Israel. We can classify the third group comprised of Emirates and Etihad as *plausible deniers* of Israel. Their online route maps omit Israel and a limited set of other country names. The fourth group of international airlines are *intentional deniers* of Israel. They name all countries except Israel. For purposes of empirical investigation, we combine plausible and intentional deniers into a single denier categorization, thus reducing online route map modes to three: embracer, avoider and denier.<sup>8</sup>

Targeted omission of countries from maps is unusual, even among countries with chilly relations. None of the international airlines from China we reviewed –Air China, Cathay Pacific, China Eastern Airlines, China Southern Airlines, Dragonair, and Hainan Airlines– use online route maps omitting Taiwan, a country that China does not recognize.<sup>9</sup> None of the online route maps for international airlines from the US omit Cuba, North Korea or Iran, the trio of countries US President George W. Bush labelled as an “axis of evil” in 2002.<sup>10</sup>

Not all international airlines based in the Middle East deny Israel’s existence on online route maps. Two notable exceptions are Egypt-based Nile Air and Saudi Arabia-based Flynas. Nile Air is an “Egyptian Joint Stock Company established in 2008, and is 'mainly owned' by Dr. Nasser Al Tayyar, former President of Al Tayyar Group, a prominent travel agency based in Kingdom of Saudi Arabia.” The airline flies from Cairo and Alexandria to destinations in Saudi Arabia, Kuwait, Iraq, and Sudan. The airline does not serve Israel. Yet, its online route map is based on a generic Google map, names both Israel and Jerusalem, and bears the Google logo.

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<sup>8</sup>Unless otherwise indicated below, all results from empirical analyses based on the three-category mode combining plausible and intentional deniers also apply to re-analyses using the four-category mode separating plausible from intentional deniers.

<sup>9</sup>Relatively few countries recognize Taiwan. For a list of such countries, see [https://en.wikipedia.org/wiki/Political\\_status\\_of\\_Taiwan](https://en.wikipedia.org/wiki/Political_status_of_Taiwan).

<sup>10</sup>See <http://www.pbs.org/wgbh/pages/frontline/shows/tehran/axis/map.html>.

Flynas is a privately owned Saudi Arabian budget carrier launched in 2007.<sup>11</sup> In early 2016, it also used a generic Google map, which named Israel and Jerusalem.<sup>12</sup>

International airlines based in countries with majority-Islamic populations do not necessarily deny Israel's existence on online route maps. Royal Jordanian Airlines and Turkish Airlines both fly to Tel Aviv and depict this destination city, but they do not name Israel on online route maps. Royal Jordanian Airlines is part of the OneWorld alliance while Turkish Airways is part of the Star alliance. Another Star alliance member, Egypt Air, treaty-bound to serve Israel, is a peculiar exception. Service to Israel was established in 1982 in accordance with the Egypt-Israel peace treaty, which called for the national airline of each country to fly regularly in and out of the other country's main international airport. While Israel's El Al flies to Egypt with marked El Al planes, Egypt Air employs a different approach for flying into Israel. It created a separate division called Sinai Air, operating planes with no exterior markings. The flights are not listed on Egypt Air's website, nor can one make online reservations and ticket purchases for flights to Tel Aviv's Ben Gurion International Airport. The subterfuge ends when passengers step into the airline cabin. The Sinai Air plane interior is "full of Egypt Air symbols" on flight attendant uniforms and cocktail napkins bearing the Egypt Air logo. A pre-flight announcement tells passengers that, "Egypt Air welcomes you onboard Flight 4D-54 to Tel Aviv . . ."<sup>13</sup>

Some international airlines from the Middle East pair denial of Israel's existence on online route maps with other more conventional forms of discrimination that explicitly treat customers differently. In 2015, Kuwait Airways denied service on a New York-to-London flight

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<sup>11</sup>See <http://www.nasaviation.com/en/about.aspx>.

<sup>12</sup>By July 2016 Flynas had switched to an avoiding map indicating only destination city names.

<sup>13</sup>See <http://www.theglobeandmail.com/news/world/hush-hush-on-egypts-phantom-flight-to-israel/article627176/>.

to an Israeli passport holder married to a US citizen. A state-owned airline, Kuwait Airways noted that Kuwait did not recognize Israel and that domestic Kuwaiti law barred carriage of Israelis on Kuwait Airways, even for flights between countries that do recognize Israel. Ordered on September 30, 2015 to cease such “unreasonable discrimination” by the US Department of Transportation (DOT), Kuwait Airways responded by dropping the route.<sup>14</sup> In the words of the *New York Times*, “Kuwait Airways drops flights to avoid Israeli passengers.”<sup>15</sup> Other international airlines engage in more benign forms of religious-based product differentiation. In 2015, two entrepreneurs with Hindu backgrounds launched Rayani Air to serve observant Muslim travelers based in Malaysia. While depicting Israel and all other countries on the online route map, Rayani Air also promised customers flights including “prayers, halal meals, and a dress code for attendants.”<sup>16</sup>

At least three facts from this review of our empirical context merit highlighting. First, several international airlines intentionally deny the existence of Israel on online route maps, while two others, Emirates and Etihad, plausibly deny Israel’s existence by failing to depict it on online route maps in contrast to acknowledging the names of most other countries in the world. Second, three deniers are members of international alliances including prominent US carriers. Saudia and Middle East Airlines are members of the SkyTeam alliance including Delta Airlines. Qatar Airways is in the OneWorld alliance including American Airlines. Third, online route maps of several deniers bear the Google logo.<sup>17</sup>

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<sup>14</sup>See <http://www.cnn.com/2015/12/17/aviation/kuwait-airways-flight-israeli-passengers/>; and <https://www.transportation.gov/sites/dot.gov/files/docs/Kuwait-Airways-Letter-Sept-30-2015.pdf>.

<sup>15</sup>See [http://www.nytimes.com/2016/01/16/business/kuwait-airways-drops-flights-to-avoid-israeli-passengers.html?\\_r=0](http://www.nytimes.com/2016/01/16/business/kuwait-airways-drops-flights-to-avoid-israeli-passengers.html?_r=0).

<sup>16</sup>See <http://www.usnews.com/news/business/articles/2015-12-23/malaysias-new-islamic-airline-takes-off-with-a-prayer>. The airline is now defunct. See [https://en.wikipedia.org/wiki/Rayani\\_Air](https://en.wikipedia.org/wiki/Rayani_Air).

<sup>17</sup>For many of these maps, clicking on the Google logo delivers a standard Google map depicting all country names.

Having documented modes by which international airlines treat Israel on online route maps, we next develop a theoretical framework for analyzing discriminatory product differentiation based on customer preferences and owner tastes, individually and in tandem. We then turn to three empirical tasks. First, we document the extent to which customer preferences and owner tastes, respectively, explain variation in airline treatment of Israel on online route maps. Second, we investigate whether the same forces explaining online route map treatment of Israel also explain variation in airline treatment of Jews via decisions to list kosher meal options on online inflight menus. Finally, we analyze how likely airline customer preferences and owner tastes explain whether an airline is a member of the Star, OneWorld or SkyTeam alliances.

### **3. THEORETICAL BACKGROUND**

#### **3.1. Two Lenses**

While discrimination is often studied in economics, more work analyzes discrimination in labor markets, rather than potentially discriminatory disparate impacts arising from the functioning of product markets.<sup>18</sup> We can view product differentiation designed to attract certain customers and deter others through two theoretical lenses: one is a product positioning lens in the tradition of Harold Hotelling (1929); another is a customer discrimination lens in the tradition of Becker (1957). First, imagine a differentiated product market with a one-dimensional attribute located on a Hotelling line. In our context one might envision a one-dimensional product spectrum that measures the degree of distaste that international airline customers have for Israel, Jews, and travelling with Israelis or Jews. An airline seeking the patronage of customers preferring to acknowledge neither Jews nor Israel nor travel with Jews or Israelis might then locate at the

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<sup>18</sup>See, for example, Altonji and Blank (1999), Ayres (2001), Bertrand and Mullainathan (2004), Pager and Shepherd (2008), among many others.

extreme end of the spectrum. They would be inclined to deny Israel's existence on online route maps, not to fly to Israel, and to omit kosher meal options from online menus. As we move from that extreme position back toward the middle, we would find airlines increasingly interested in the patronage of customers who acknowledge Jews and Israel, and are willing to travel with Jews and Israelis. These airlines would be more inclined to depict Israel on online route maps even if they did not fly to Israel. They would also be more likely to list kosher meal options on online inflight menus.

The operation of differentiated product markets –and, in particular, whether customers find a product matching their tastes– often depends on the size of fixed costs in relation to market size. Suppose that fixed costs are high enough so that there is only international one airline along the product spectrum. Customers will face different “travel costs” represented by distance from their preferred product position and the product’s actual positioning on the spectrum. If the distribution of preferences is single-peaked, then it is generally most profitable for the airline to locate its product at a position corresponding to the peak. Customers with most-preferred locations nearer to that position will benefit more than customers with preferred locations further away.

At what point does product positioning on this spectrum become discriminatory from a customer’s perspective? The answer to this question is subtle. Even in the absence of intent to discriminate, product markets can appear to be guided by an apparent “tyranny of the majority” (Waldfogel, 2007). The larger the number of customers who prefer a product located, say, on the extreme end of the spectrum, then the less attractive that same product becomes to remaining customers preferring locations nearer to the middle. The positioning of daily newspapers in many US cities provides a useful illustration of this idea. Newspaper preferences differ sharply

between black and white readers. The larger the white population of a metropolitan area –for a given non-white population– the more that a newspaper caters to the preferences of white readers and *vice versa*. Lisa George and Joel Waldfogel (2003) document negative cross-group consumption effects in US daily newspaper markets such that more whites in one newspaper market reduces the tendency among blacks to read that newspaper. While this mechanism can give rise to harm imposed by one larger group on another smaller one, it is not intentional discrimination, but a benign side effect of the operation of differentiated product markets.

Interestingly, in this example, differentiated products markets can deliver less satisfaction to some group of likely customers (*e.g.*, minorities) even if neither the likely customers nor the firms' managers harbor animus toward the affected group. Instead, the differential satisfaction arises simply from product preferences that differ across groups, in conjunction with substantial fixed costs. Along these lines, Steven Berry, Alon Eizenberg, and Waldfogel (2016) document that local US radio broadcasting market entry patterns belie an “implicit planner” who attaches roughly twice the value to marginal white, relative to black, listeners.

While disparate treatment of some customer group can arise without discriminatory intent by majorities, such firm behavior can also signal discriminatory product differentiation. Suppose whites in a majority-white community not only have different news coverage preferences from minority blacks but also have specifically discriminatory preferences –say, for news coverage that criticizes black community leaders. Creating a newspaper with an anti-black bias would likely deter black patronage but could also attract more white patronage and advance the owner's profit goals. In this hypothetical example, discriminatory product differentiation would arise out of an owner's willingness to accommodate the animus of likely customers, rather than out of his or her own discriminatory attitudes.

Owners might also bring their own discriminatory tastes to this behavior, making a product unappealing to some customers in a way that reduces profitability. We can again use a newspaper example to illustrate this possibility. Think of a newspaper owner choosing where to locate on a political spectrum. Perhaps the owner has goals apart from profits. Then one might infer excessive discrimination if, say, a right-leaning owner located his or her product to the right of the position that delivered the most profit available from likely customers. Positioning farther to the right than would maximize profits costs the owner profits but also indulges his or her more right-leaning political tastes. Matthew A. Gentzkow and Jesse M. Shapiro (2010) developed this approach to measure media bias in US daily newspaper markets. We would analogously view international airline owner decisions to deny Israel's existence on route maps –when customers might be satisfied with mere avoidance– as discriminatory product differentiation motivated by owner tastes.<sup>19</sup>

Becker (1957) suggests that competition can discipline the exercise of discriminatory product differentiation derived from owner tastes. But competition requires several alternative suppliers and non-discriminatory customers willing to switch business. Only then will these same owners see reduced profits and greater risk of being driven from the market. If alternative suppliers are hard to come by or if customers persist in their discriminatory preferences, then competitive processes may not compel owners to reduce, let alone eliminate discriminatory product differentiation. Our empirical investigation seeks to identify and analyze customer

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<sup>19</sup>Labelling product positions that serve owner goals other than profit maximization as “discrimination,” in the sense of being illegitimate or illegal, is questionable. Owners in most of the world have speech rights, and it is hard to imagine regulating product positions in differentiated product markets. Still, we think it reasonable to infer motivations as we do in this study.

preference-based and owner taste-based motivations for discriminatory product differentiation by international airline treatment of Israel, Israelis and Jews.

### **3.2. Anti-Zionism vs Anti-Semitism**

Observers sometimes distinguish opposition to Israel and Israelis from opposition to Jews. For example, Saudi Arabia bans Israelis from the country but allows Jews. The Saudi labor ministry bars entry “only to those with Israeli citizenship. Other than that, we are open to most nationalities and religions.” A Saudi spokesman describes the policy as evidence that the kingdom is open to other religions.<sup>20</sup> Hence, refusal to serve Israelis on the basis of nationality and denying Israel’s existence on online route maps can be viewed as mere compliance with the domestic law of countries that do not recognize Israel. Such compliance may be especially important when an international airline is also majority state-owned as in the 2015 Kuwait Airways case.<sup>21</sup> Whether an airline lists kosher meal options on online menus reflects a different decision. Jews might follow *kashrut* regardless of their nationality. An airline seeking to serve

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<sup>20</sup>See <http://www.timesofisrael.com/saudi-arabia-jews-now-allowed-to-work-here/>.

<sup>21</sup>On the other hand, the September 30, 2015 decision of the US Department of Transportation (US DOT) ordering Kuwait Airways to serve Israelis seeking to fly from New York to London also held that US transportation laws against discriminatory practices by air carriers (49 U.S. Code § 41310) bars such unreasonable discrimination occurring in the US and other third-party countries where Israel is recognized. See US DOT September 30, 2015 letter here: <https://www.transportation.gov/sites/dot.gov/files/docs/Kuwait-Airways-Letter-Sept-30-2015.pdf>. This US DOT decision also held that Kuwait Airways’ action was also inconsistent with and possibly in violation of regulations promulgated by the US Department of Commerce (US DOC) pursuant to US anti-boycott laws (Sec. 3 of the U.S. Export Administration Act of 1979, Pub. L. 96-72, 93 Stat. 503) prohibiting foreign firms in the US from refusing to do business with nationals of a boycotted country when such refusal is pursuant to a requirement of the boycotting country. US anti-boycott laws and related US DOC regulations were enacted to prohibit and or penalize cooperation with international economic boycotts in which the US does not participate. Domestic Kuwaiti law at issue in the Kuwait Airways case was enacted pursuant to the Arab League’s boycott against persons doing business with Israel. US policy opposes this boycott. The same US DOC regulations also encourage, and in specified cases, require US firms to refuse to participate in foreign boycott activities the US does not sanction. These regulations prevent US firms from being used to implement foreign policies of other nations which run counter to US policy. See relevant US DOC regulations here: <https://www.bis.doc.gov/index.php/enforcement/oac>. We discuss their possible application to US carriers and other US firms in the concluding section of this study.

Jews, even if prohibited by domestic law from serving Israelis, would then have incentives to publicize online inflight kosher meal options.

With these distinctions in mind, we examine two dimensions of discriminatory product differentiation related to likely customer preferences and owner tastes: the treatment of Israel on online route maps; and whether kosher meal options are available on online inflight menus. The first dimension is arguably anti-Zionist and relates specifically to Israel and Israelis rather than Jews. The second dimension is arguably anti-Semitic and relates specifically to Jews rather than to Israel and Israelis.

#### **4. EMPIRICAL METHODS**

##### **4.1. Data and Sampling**

Data for this study feature information on up to 111 airlines flying international routes in the first quarter of 2016. To arrive at 111, we begin with a list of 522 airlines listed on openflights.org, a Singapore-based website mapping flights around the world.<sup>22</sup> Of these, only 196 airlines serve at least 25 destinations. We search for online route maps for these 196 airlines and include them in our base sample if two conditions hold: they have an online route map; and the online route map covers the Middle East, including Israel. Thus, for example, regional airlines serving only Southeast Asia are excluded. With these conditions, we get to the 111 airlines in our base sample. They include the world's largest airlines (*e.g.*, Delta Airlines), many state-owned airlines (*e.g.*, Qatar Airways) and some smaller airlines (*e.g.*, Ryani Air) with online route maps depicting the Middle East.

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<sup>22</sup>For more information on openflights.org, see <http://openflights.org/about>.

#### **4.2. Outcome Variables: Route Map Treatment, Meal Options, and Alliance Membership**

We create three outcome variables of interest for each international airline in our base sample: 1) online route map treatment of Israel (*RMT*); 2) kosher meal options on online inflight menus (*KMO*); and 3) membership in one of the three alliances including prominent US carriers (*Alliance member*). For the first outcome variable, *RMT*, we observe the treatment of Israel on an airline's online route map and categorize that treatment either as an Israel embracer (*RMT* = 3), avoider (*RMT* = 2) or denier (*RMT* = 1), including both plausible and intentional deniers according to our 3-level taxonomy described above. Our reliance on online rather than printed maps has advantages. Online maps are available to travelers anywhere in the world with web access, are used by likely customers, and have zoom-in capabilities to permit depiction of country names for even small states after re-scaling. This contrasts with single-scale printed route maps in the back of many airline magazines. They are typically found in airline lounges for ticketed in-transit travelers and seatback pockets facing ticketed in-flight passengers.

For our second outcome variable, *KMO*, we obtain data on whether an international airline lists inflight kosher meal options on the airline website or on a travel website that collects and publishes this information for airlines, [wanderbat.com](http://wanderbat.com).<sup>23</sup> We categorize airlines as either including online inflight kosher meal options (*KMO* = 1) or not (*KMO* = 0). The logic of using online listings is similar to use of online route map treatment for *RMT*. Online listings are more readily available to potential customers choosing airlines or ticketed (but not yet travelling) customers able to switch airlines.

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<sup>23</sup>For more information on [wanderbat.com](http://www.wanderbat.com), see <http://www.wanderbat.com/>.

For our third outcome variable, we review international airline and alliance websites to learn which airlines are listed in the Star, OneWorld, and SkyTeam alliances. We categorize airlines as either in an alliance (*Alliance member* = 1) or not (*Alliance member* = 0). We confirm categorical measurement of *Alliance member* by cross-checking information at the focal airline's website (e.g., Qatar Airways), the US carrier's website (e.g., American Airlines), and the alliance website (e.g., OneWorld). Terms of alliances differ, but they typically permit shared use of facilities such as airline lounges and employees such ground crew, as well as coordinated benefits such as mutual recognition of frequent flyer programs or the purchase of around-the-world tickets requiring multiple carriers (Wang and Evans, 2003). We do not require that airlines also list common flight codes with alliance members, though codesharing is frequent among alliance members.

#### **4.3. Explanatory Variables: Likely Customer Preferences and Owner Tastes**

The main explanatory variables of interest are measures of likely customer preferences and owner tastes. For likely customer preferences, we develop international airline-specific measures of likely customer anti-Semitism (*CAS*) and likely customer kosher interest (*CKI*). For *CAS* measures, we combine information on the geographic origin of an airline's prospective or actual ticket holders –likely customers-- with the average anti-Semitism levels of their home countries. The Anti-Defamation League (ADL) provides survey-based data on the degree of anti-Semitism in 100 countries.<sup>24</sup> Measures of anti-Semitism range from 0-100 with 100 indicating the highest degree of anti-Semitism. The ADL data indicate substantial variation across the world with highest measures in the Middle East. Iraq has the highest index value at 92, followed in

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<sup>24</sup>For details on the ADL survey methods and measures see <http://global100.adl.org/>.

descending order by 88 for Yemen, 87 for Algeria, 86 for Tunisia, 82 for Kuwait, 81 for Bahrain and Jordan, and 80 for Morocco, Qatar and the UAE. By comparison, the same index value is eight for the UK, nine for the US, 27 for Germany, and 37 for France.

While we cannot directly observe the geographic origin of likely customers, we can indirectly observe geographic origins of Google-based searches likely to bring them to visit airline websites. Google Trends provides information on the use of particular search terms by these visitors across countries since 2004. We obtain measures of use intensity in Google searches for each international airline’s name, by country, for the period from 2004 to the first quarter of 2016 from the Google Trends site.<sup>25</sup>

Our approach yields reasonable-looking measures of likely customer locations. A Google Trends search on Russian carrier “Aeroflot” yields the maximum index value of 100 on a 0 to 100 scale for Russia. The index values are 45 for Armenia, 32 for Kyrgyzstan, 17 for Uzbekistan, 17 for Cyprus, 14 for Latvia, 13 for Azerbaijan, 13 for Belarus, 11 for Kazakhstan, 8 for Ukraine, 8 for Moldova, 8 for Estonia, 6 for Hong Kong, 6 for Israel; and index values are lower for an additional 30 countries. Other searches yield more geographically concentrated results. A search on “Air Caraïbes” yields the maximum index value of 100 for St. Martin. The second highest index value is 75 for St. Barthélemy, 48 for French Guiana, 45 for Martinique, 43 for Guadeloupe, 3 for Haiti, 1 for metropolitan France, and 1 for the French overseas department of Réunion.

The Google search index is a per-search use intensity measure, so it should be weighted by the country size to determine a distribution of interest in an international airline across

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<sup>25</sup>See <https://www.google.com/trends/>.

countries. We might weight measures by population, but it seemed better to weight by GDP, since larger countries economically likely use more international airline services. Using this approach, we calculate a likely customer anti-Semitism measure for each international airline  $i$  as follows:

$$CAS_i = \sum_{c \in C} \left( \frac{Google_i^c GDP^c}{\sum_{c \in C} Google_i^c GDP^c} \right) ADL^c,$$

where  $Google_i^c$  is the Google search index for airline  $i$  in country  $c$ ,  $GDP^c$  is 2010 GDP in country  $c$  as reported by the World Bank,  $ADL^c$  is the ADL anti-Semitism index for country  $c$ , and  $C$  is the full set of countries. Thus,  $CAS$  measures the customer anti-Semitism for a given airline on a 0 to 100 scale.

We develop  $CKI$  measures of customer kosher interest similarly. We first obtain the search intensity on use of the word “kosher” by country. For each international airline, we then weight these search intensities by the GDP-weighted search intensities on the respective airline names. Our approach yields reasonable results. A Google Trends search on kosher for Israel’s Arkia Airline yields a  $CKI$  index value of 90 on a 0 to 100 scale. The second highest  $CKI$  index value is 65 for El Al, followed by the major US and Canadian carriers with  $CKI$  index values from 35 to 45. International airlines with the lowest kosher index values are below 0.4: Saudia, Flynas, TAAG Angola, Kazakhstan’s Air Astana, and Egypt’s Nesma.

For measurement of owner’s taste, we note that many international airlines are majority state-owned. This arguably simplifies the determination of owner taste. We can reasonably infer that majority state-owned international airlines located in countries not recognizing Israel have owners with a taste for discrimination against Israel and Israelis, and perhaps Jews no matter

their citizenship. Our data on whether the airline is majority state-owned are from the International Civil Aviation Organization (ICAO), a UN specialized agency managing the administration and governance of the Convention on International Civil Aviation.<sup>26</sup> We obtain from Wikipedia information on whether an airline's home-country government does not recognize Israel.<sup>27</sup> 15 countries represented in our sample, most in the Middle East, do not recognize Israel: Algeria, Tunisia, Kuwait, Bahrain, Morocco, Qatar, UAE, Lebanon, Oman, Saudi Arabia, Syria, Malaysia, Indonesia, Bangladesh, Pakistan, and Yemen.

Among the 111 international airlines in our underlying sample, 23 are from countries that do not recognize Israel, 46 are state-owned, and 17 are both state-owned and from countries that do not recognize Israel. We use this information to create our categorical measure related to likely owner's taste: *SODR* is a categorical measure indicating whether an international airline is majority state-owned by a country not recognizing Israel (*SODR* = 1) or not (*SODR* = 0).

#### 4.4. Control Variables

In addition to these explanatory variables of main interest, we add variables to serve as controls. The size and safety rating of international airline operations may also explain variation in online route map treatment and the availability of online inflight menu kosher meal options. Larger airlines are also more likely to adhere to international norms including political norms related to the recognition of UN member states, social norms related to dietary preferences of passengers, and commercial norms permitting cooperation among airlines. To control separately for these possibilities, we collect data from Wikipedia on airline fleet size and take the natural log of that

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<sup>26</sup>For details on state-owned airlines available at ICAO see  
<http://www.icao.int/sustainability/documents/privatizedairlines.pdf>

<sup>27</sup>For a list of countries recognizing and not recognizing Israel as of the first quarter of 2016 see  
[https://en.wikipedia.org/wiki/International\\_recognition\\_of\\_Israel](https://en.wikipedia.org/wiki/International_recognition_of_Israel).

number of aircraft (*Aircraft*). We also collect data on airline safety (*Safety*) from the *West Australian*, a newspaper grading airlines from 0 to 7 with seven being the highest safety rating.<sup>28</sup> An alternative means of achieving broader operational scale and scope is through alliance membership, thus we also include the *Alliance* term as a control in some estimations. All control variable measures are current to the first quarter of 2016. We include *Aircraft*, *Safety* and *Alliance* as controls in all regression analyses of online route map treatment and kosher meal availability.

We have complete data for analysis of online route map treatment for 104 of 111 international airlines in our base sample. We have complete data for analysis of online inflight menu kosher menu options for 77 of 111 airlines in our base sample.

## 5. EMPIRICAL RESULTS

### 5.1. Descriptive Evidence and Preliminary Analytical Results

Table 1 reports sample means, standard deviations and pairwise correlations for all variables used in our study. Sample means for the three dependent variables comport with intuition. The *RMT* mean (2.57) indicates that most of the 111 international airlines in our base sample –71 airlines- are embracers, while 33 are avoiders. Only seven are deniers: Emirates, Etihad Airways, Flydubai, Kuwait Airways, Middle East Airlines, Qatar Airways, and Saudia. The *KMO* mean (0.78) indicates that a little more than three quarters of sampled airlines also offer kosher meal options on online inflight menus. The *Alliance* mean (0.45) indicates that 49 of the 111 airlines are also members of one of the three major alliances.

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<sup>28</sup>For details on airline safety ratings see <http://www.airlineratings.com/>. For details on the underlying data used to make safety rating assessments, see [http://www.airlineratings.com/safety\\_rating\\_criteria.php](http://www.airlineratings.com/safety_rating_criteria.php).

Descriptive statistics for route map treatment (*RMT*) merit closer study to understand whether use as an ordered dependent variable is warranted. Recall that only seven of the 111 international airlines in our base sample are deniers while most are embracers. What about avoiders? Do they lie between these two groups based on other relevant indicators? 18 of the 33 avoiders are also from Islamic-majority countries while 14 of the 33 do not recognize Israel. Eight of the 71 embracers are from Islamic-majority countries while only three do not recognize Israel. These patterns suggest that airline online route map avoiders do lie between deniers and embracers in an ordered structure.

-----Insert Table 1 approximately here-----

Pairwise correlations in Table 1 provide additional support for treatment of *RMT* as an ordered variable. *RMT* is positively correlated with other dependent variables like *KMO* (0.35, p < 0.05), confirming intuition that more favorable treatment of Israel (and Israelis) on online route maps also means more favorable treatment of Jews looking for kosher meal options on online inflight menus. Also in line with intuition is *RMT*'s negative pairwise correlation with two key explanatory variables: the *CAS* measure of anti-Semitic likely customer preferences (-0.48, p < 0.05); and the *SODR* measure of likely (state) owner tastes against the recognition of Israel (-0.61, p < 0.05). *RMT* is also positively correlated with other control variables such as *Safety* (0.23, p < 0.05), confirming yet another intuition that international airlines meeting the higher safety standards are also more likely to meet other international norms related to recognition of UN member states. We take these pairwise correlations as additional evidence supporting the treatment of *RMT* as an ordered variable as well as preliminary evidence in support of our proposition that likely customer preferences and owner tastes affect online route map treatment of Israel.

Other preliminary evidence supporting our proposition is presented in Figures 8, 9 and 10. In Figure 8 we use Stata's "lowess" (locally-weighted scatterplot smoothed) procedure to analyze *RMT* trends explained by *CAS*, our measure of likely customer preferences. The lowess curve for *RMT* in Figure 8 declines as likely airline customer anti-Semitism increases. International airlines are more likely to avoid or deny Israel's existence on online route maps as they have higher likely customer anti-Semitism.

Figure 8 also indicates which international airlines exhibit online route map treatment of Israel closer to likely customer preferences and which airline route maps may deviate from those preferences. Greece-based Aegean Airlines, Uzbekistan Airlines, Flynas, and Nile Air each embrace Israel despite higher *CAS* values. It is perhaps not surprising that Kuwait Airways, which has the highest *CAS* value, also omits Israel from online route maps. Emirates and Etihad both market themselves to likely customers from outside the Middle East. As more "outward-facing" airlines in the region, they also exhibit substantially lower *CAS* values than, say, Kuwait Airways, Qatar Airways, or Saudia. Their different likely customer preferences help explain their more nuanced route map treatment that omits other country names along with Israel.

-----Insert Figure 8 approximately here-----

Figure 9 presents analogous lowess results for the relationship between kosher meal options (*KMO*) and likely customer kosher interest (*CKI*). For ease of interpretation, we include in Figure 9 only international airlines with *CKI* values from 0 to 40, thus excluding Israeli and many US carriers with higher *CKI* values. The upward-sloping line indicates that increasing likely customer interest in kosher is associated with higher likelihood of kosher meal options on online inflight menus. When *CKI* values reach 10, the share of airlines offering kosher meal options is 80 percent. When *IKM* values reach 20, the same share is 90 percent.

-----Insert Figure 9 approximately here-----

Figure 10 presents a bar chart comparing alliance membership percentages for international airlines that embrace Israel on online route maps ( $RMT = 3$ ) to percentages for airlines that avoid or deny Israel ( $RMT = 1$  or  $2$ ). About 50 percent (35) of the 71 embracers are members of either the Star, OneWorld or SkyTeam alliances, but only 37 percent (15) of 40 avoiders or deniers are alliance members.

-----Insert Figure 10 approximately here-----

Figures 8 and 9 indicate that likely customer preferences matter for explaining variation in discriminatory product differentiation related to online route map treatment and the availability of online inflight menu kosher meal options. Figure 10 suggests that more inclusive (*i.e.*, embracing) route map treatment may also matter for inclusion in alliances including prominent US carriers. To confirm and elaborate on this preliminary evidence, we next turn to multivariate analyses.

## **5.2. Ordered Probit Regression Results: Israel's Online Route Map Treatment**

Table 2 reports ordered probit regression estimates where the dependent variable is  $RMT$ , which takes the value of one when international airline online route map treatment indicates a denier, two when the airline is an avoider, and three when the airline is an embracer depicting Israel on its online route map. We have complete data on likely customer preferences ( $CAS$ ) and owner tastes ( $SODR$ ) for 111 airlines, but only 104 airlines also have data for the three additional variables controlling for whether the airline is an alliance member ( $Alliance$ ), the logged number of aircraft in the airline's fleet ( $Aircraft$ ), and airline safety rating ( $Safety$ ). Column 1 of Table 2 explains variation in  $RMT$  with just our main explanatory variables of interest,  $CAS$  and  $SODR$ . Negative signs for both terms significant at commonly-accepted levels ( $p < 0.05$  for  $CAS$  and  $p <$

0.01 for *SODR*) indicate that both likely customer preferences and owner tastes matter for understanding this form of discriminatory product differentiation.

-----Insert Table 2 approximately here-----

Columns 2 through 4 add the three control variables one at a time; column 5 adds them together. Alone or together, none of the controls are statistically significant. Results for *CAS* and *SODR* are unchanged in sign or significance with the inclusion of the controls. Results in Table 2 suggest that discriminatory product differentiation exemplified by the omission of Israel from route maps is more likely with more anti-Semitic customer preferences and with owner tastes reflecting state policy against the recognition of Israel.

### **5.3. Probit Regression Results: Online Menu Kosher Meal Options**

International airline treatment of Israel on online route maps is something like an “all-or-nothing” product positioning decision. Whatever decision a firm makes, then all likely customers experience it. A decision about whether to list kosher meal options on online inflight menus is different. In addition to default in-flight menu choices, many airlines list vegetarian, diabetic, halal, and Hindu meal options, as well as kosher meal options online. The decision to offer online inflight kosher meal options does not deny another likely customer his or her option to choose a different meal option. That said, listing inflight kosher meal options on airline websites and other media channels may be repugnant to anti-Semitic likely customers and owners.

Table 3 reports probit estimates with *KMO* as the dependent variable. We have data on all of the included variables for 77 airlines. In addition to the KMO dependent variable, we include likely customer preference for kosher meals (*CKI*), likely owner tastes (*SODR*), and alliance, safety, and fleet size variables. Column 1 explains the likelihood of an airline listing

kosher meal options on online menus based on likely airline customer kosher interest (*CKI*) and state ownership by a country not recognizing Israel (*SODR*). The positive sign on *CKI* ( $p < 0.01$ ) and negative sign on *SODR* ( $p < 0.05$ ) are both significant at commonly-accepted levels, and suggestive that both likely customer preferences and owner tastes matter for understanding this alternative form of discriminatory product differentiation.

-----Insert Table 3 approximately here-----

Columns 2 through 4 include our control variables one at a time, and column 5 includes them together. In column 2, alliance membership (*Alliance*) enters positively and significantly ( $p < 0.10$ ) as does aircraft fleet size (*Aircraft*) in column 3 ( $p < 0.05$ ). These results follow intuition that increasing operational scale and scope also increases the potential breadth of likely customers, some of whom may seek inflight kosher meal options. These two controls retain their positive signs but are not significant at commonly accepted levels when both appear in column 5.

Inclusion of these controls sometimes reduces the level of statistical significance for both likely customer preference (*CKI*) and owner tastes (*SODR*), but predicted signs persist with statistical significance at the 10 percent level or better, across columns 2 through 5. Results in Table 3 suggest that both airline likely customer preferences and owner tastes matter for a related aspect of discriminatory product differentiation aimed less at Israel, Israelis and anti-Zionism, and more at Jews and anti-Semitism. Greater kosher interest among likely customers increases the likelihood that online inflight menus will include kosher meal options of interest to Jews globally. State ownership by countries not recognizing Israel decreases that same likelihood relevant to Jews.

#### **5.4. Fixed Effects Regression Results: Alliance Membership**

Alliance leaders, among them prominent US carriers like United Airlines, American Airlines, and Delta Airlines, can influence which international airlines to include as members. We assume that alliance leaders look for partners with substantial assets and high safety ratings. We also assume that alliance leaders look for partners that do not engage in the kind of discriminatory product differentiation we have been analyzing. We might expect alliances to look for new members that acknowledge Israel on online route maps, and publicize inflight menu kosher meal options for likely customers searching for flights online. Such non-discriminatory product differentiation comports with the behavior of US carriers and other larger airlines. If alliance partners did not comport with such practices, then those same prominent US carriers might still consider including them, but on an attenuated basis to lessen any negative business repercussions. A case in point is Delta's announcement in 2011 that Saudia was joining the SkyTeam alliance. Critics highlighted Saudia business practices discriminating against Israel and Israelis, against travelers carrying non-Islamic religious accessories (*e.g.*, Bibles), and against travelers bearing passports with Israeli entry and exit stamps, all of which led to a public relations embarrassment for Delta.<sup>29</sup>

What international airline characteristics increase the likelihood of inclusion in these major alliances? We explore this in Table 4 with models linking alliance membership to five variables: whether the international airline is government-owned in a country not recognizing Israel (*SODR*), whether the airline's online route map embraces Israel (*Embracer*), the airline's safety rating

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<sup>29</sup>For details about the June 2011 announcement and criticism, see <http://www.dailymail.co.uk/news/article-2007780/U-S-Jews-angered-Delta-partnership-Saudi-Arabian-Airlines-amid-anti-Semitic-policy.html>. For details on Delta Airlines' June 2011 press release touting its own non-discriminatory policies (but not those of Saudia), see <http://news.delta.com/delta-issues-statement-saudi-arabian-airlines>.

(*Safety*), and the size of the airline's fleet (*Aircraft*). We also report specifications including an indicator for whether the airline publicizes inflight kosher meal option on online menus (*KMO*).

Column 1 reports probability derivatives from a probit estimation including all but the online inflight menu kosher meal options variable (*KMO*). Using these variables, our sample includes 104 airlines. The only variable with a statistically significant coefficient is fleet size (*Aircraft*) ( $p < 0.01$ ). Larger international airlines are more likely to be included in the Star, OneWorld or SkyTeam alliances. When we also include the *KMO* term in column 2, the only significant coefficient continues to be *Aircraft*.

-----Insert Table 4 approximately here-----

This pattern of results persists across columns 2 through 4 of Table 4. In column 2, we use linear rather than probit estimation. In column 3 we again use linear estimation but this time with continental fixed effects (e.g., North America). In column 4, we do the same but with regional fixed effects (e.g., Western Asia). In column 5, we do the same but with country fixed effects (e.g., Saudi Arabia) --recall that several countries are homes to multiple airlines.<sup>30</sup> These different fixed effects control for unspecified factors differing between continents, regions and countries. Across columns 2 through 5 in Table 4, neither key explanatory term is significant, only *Aircraft*. Among international airlines in a given continent, region or country, those with larger fleets are more likely to be included in alliances including prominent US carriers. Indeed, a lowess analysis of *Aircraft* and *Alliance* in Figure 11 illustrates the clearly positive relationship

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<sup>30</sup>When we conduct a Hausman test comparing the country fixed effects model with its random effects analogue, we do not reject the hypothesis that the country fixed effects are uncorrelated to the included variables. Hence, the more efficient random effects estimates – strongly resembling the estimates in column 2– may be relied upon for inference.

between fleet size and alliance membership. Discriminatory customer preferences and owner tastes are not significant.

-----Insert Figure 11 approximately here-----

We might interpret these results as indicating that current alliance members, including prominent US carriers, do not care about discriminatory product differentiation when considering international airlines for inclusion as new members. Another interpretation suggests that current alliance members have little choice about which airlines from the Middle East to include as new alliance members. Table 5 offers evidence along these lines. Sampled airlines from the Middle East - the region also classified as “Western Asia” by the UN<sup>31</sup> are listed from those with the most to the fewest route destinations. We also list airline home country, route map treatment mode, safety rating, and whether the airline is a member of the Star, OneWorld or SkyTeam alliances. It is clear that airlines with more routes and aircraft are also more likely to be in one of these alliances, even if they are also online route map deniers. In the end, US carriers in these alliances may accommodate airlines that engage in discriminatory product differentiation in response to likely customer preferences and owner tastes because it serves a necessary business goal. They are part of a small group of Middle East airlines with adequate operational scale to fill a gap in an alliance’s global route network.

-----Insert Table 5 approximately here-----

## 6. CONCLUSION

### 6.1. Key Findings

Our study highlights several findings, starting with some simple facts. Online route maps for many international airlines pointedly omit Israel. Several of these online route maps bear

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<sup>31</sup>For details on UN regional classifications, see <http://www.unep.org/>.

Google logos. Some of these denier airlines are members of alliances including prominent US carriers. Online route map denial appears to be driven by likely customer preferences and owner tastes against the recognition of Israel and Israelis.

Our findings are confirmed through analysis of inflight kosher meal options on online menus, an aspect of product differentiation reflective of attitudes toward Jews rather than Israel and Israelis. Likely customer preference and owner tastes significantly affect the likelihood of online inflight kosher meal options, suggesting that anti-Semitism and not simply anti-Zionism motivate discriminatory product differentiation.

Finally, we find that international airlines engaging in such discriminatory practices are no less likely to be alliance members. Fleet size is the only significant factor explaining whether an airline is part of the Star, OneWorld or SkyTeam alliances. This finding may reflect the sparse choice that alliance leaders have in trying to fill regional gaps in global route networks. Alliance leaders may accommodate discriminatory product differentiation by certain airlines from the Middle East perhaps as much out of practical business necessity as out of perceived business advantage.

## **6.2. Research, Practice and Policy Implications**

We think our concept of discriminatory product differentiation new and novel along with the theoretical framework grounding our concept in economic theories of discrimination emphasizing both customer preferences and owner tastes (Becker, 1957). Our empirical investigation of discriminatory product differentiation is also novel in that it simultaneously identifies and assesses the significance of likely customer preferences and owner tastes motivating that behavior. Our investigation contrasts with most other empirical research on the

economics of discrimination analyzing either customer preferences (*e.g.*, Kahn, 1991; Nardinelli and Clark, 1990) or owner tastes (*e.g.*, Fershtman and Gneezy, 2001), but not both.

Our findings that certain international airlines apparently engage in discriminatory product differentiation while other actors accommodate it also has business practice and public policy implications. If one views these trends as problematic, then we might look to different sources for relief. Following Becker (1957), we might first look to market competition to root out discriminatory practices, especially those motivated by likely owner tastes rather than likely customer preferences. Here, though, the potential for competition to reduce or eliminate such discrimination may be limited. Denier airlines in our study are often majority state-owned enterprises in oil-rich countries that have not fully liberalized entry into domestic and international air travel segments. These market characteristics insulate denier airlines from profit pressures and slow, if not stifle altogether, the competitive forces for change Becker contemplated. It is also possible that many likely customers of denier airlines prefer the current state of discriminatory product differentiation. If so, then rival airlines refraining from such discrimination would divert little business.

If competitive forces are wanting, perhaps the moral and commercial suasion of certain firms can make a difference. We might initially look to prominent US carriers such as United Airlines, American Airlines and Delta Airlines, or other international airlines located in liberal democracies such as KLM in the Netherlands, Lufthansa in Germany, and Air Canada. Individually or through their alliance memberships, these airlines could challenge alliance members engaged in discriminatory practices to end them or end bilateral cooperation and revoke alliance membership. Fast-food giant McDonald's limits franchisees from customizing

food menus.<sup>32</sup> Hotelier giant Holiday Inn disciplines franchised innkeepers that fall below service standards set out in franchise agreements. Airline alliances and their largest individual members might similarly mandate standards of compliance that include rules against altering standard global and regional online route maps, such as those supplied by Google.

While promising in concept, such moral and commercial suasion by the largest airlines and alliances seems unlikely in practice. Delta Airlines is entering its sixth year of cooperation with SkyTeam alliance partners and route map deniers Saudia and Middle East Airlines. Delta Airlines communicated in 2011 that inclusion of Saudia in the SkyTeam alliance was limited to a single interline booking agreement. Delta Airlines wrote then that it did not intend to ally more closely through codesharing or mutual recognition of frequent flyer programs.<sup>33</sup> Delta Airlines has since reversed itself and now represents Saudia as a codeshare partner,<sup>34</sup> and advertises a schedule for the accrual of frequent flyer program benefits for Delta Airlines customers flying on flights marketed by Saudia.<sup>35</sup> Saudia passengers use SkyTeam member travel lounges, and are able to purchase tickets and travel on Delta Airlines flights through SkyTeam regional and global travel programs.<sup>36</sup> Increased bilateral cooperation between Delta and Saudia as well as prominence in SkyTeam publications and programs raise doubt about whether Delta Airlines

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<sup>32</sup>See sample McDonald's Franchise Agreement terms at <https://www.scribd.com/doc/233487415/McDonalds-Franchise-Agreement>.

<sup>33</sup>According to a June 2011 statement, "Delta does not intend to codeshare or share reciprocal benefits, such as frequent flier benefits, with Saudi Arabian Airlines, which we have confirmed with SkyTeam, an Amsterdam-based 14-member global airline alliance." See <http://news.delta.com/delta-issues-statement-saudi-arabian-airlines>.

<sup>34</sup>As of the first quarter of 2016, Delta Airlines also lists denier Middle East Airlines as a codeshare partner. A complete list of Delta Airlines codeshare partners is here: <https://pro.delta.com/content/agency/us/en/agent-resources/partner-information/codeshare-partners.html>.

<sup>35</sup>Delta Airlines' schedule for the accrual of frequent flyer program benefits from flying on flights marketed by Saudia is published here: [http://www.delta.com/content/www/en\\_US/skymiles/earn-miles/earn-miles-with-partners/airlines/saudia-airlines.html](http://www.delta.com/content/www/en_US/skymiles/earn-miles/earn-miles-with-partners/airlines/saudia-airlines.html).

<sup>36</sup>For a list of SkyTeam customer benefits, including those discussed in this study, see [http://static.skyteam.com//contentapi/globalassets/about-us/pdf/customer\\_benefits\\_mar\\_2014.pdf?\\_ga=1.62146916.992546940.1481515780](http://static.skyteam.com//contentapi/globalassets/about-us/pdf/customer_benefits_mar_2014.pdf?_ga=1.62146916.992546940.1481515780).

would challenge Saudia's discriminatory behavior. It may be similar for American Airlines and OneWorld. In 2016, OneWorld member and denier airline Qatar Airways became a 20 percent investor in the holding company that owns OneWorld member airlines British Airways, Iberia and Aer Lingus.<sup>37</sup> Continued capital investment is more likely to prompt continued accommodation rather than challenge by American Airlines and OneWorld of Qatar Airways' discriminatory behavior.

Perhaps Google could persuade international airlines to end discriminatory practices we document. Online maps with the Google logo dominate the airline industry with embracers, avoiders and deniers using them to depict countries, cities and routes as likely customer preferences and owner tastes dictate. Google could write commercial licenses requiring denier airlines to depict on online route maps country names of, say, all UN member states. But such a policy change could also divert business to rival mapping firms. This prospect might explain Google's current willingness to let denier airlines alter standard online global and regional maps. Indeed, Google alters its own standard online maps for commercial purposes, more recently for the Crimea where it publishes separate versions for Ukrainian, Russian and international users.<sup>38</sup> In this context, it might still make sense for Google to consider withholding use of its logo on Israel-denying maps used by discriminating airlines. Suppliers can bear substantial and long-lived reputational liability for offering their services to parties engaged in repugnant practices.

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<sup>37</sup>For details on Qatar Airway's investments in International Airlines Group during 2016, see <http://www.telegraph.co.uk/business/2016/08/01/qatar-airways-boasts-stake-british-airways-owner-iag/>.

<sup>38</sup>Google's Crimea maps depict Crimea as part of the Ukraine for Ukrainians, as having a solid border line resembling a separate country for Russians, and as having a dotted border line to reflect disputed territory for international users. For details, see <http://www.bbc.com/travel/story/20140602-the-politics-of-making-maps>.

Three quarters of a century after the fact, historians and other observers still note with opprobrium that IBM supplied punch cards to the Nazis.<sup>39</sup>

If markets and firms cannot curb the practice, then what about the law? The 2015 US DOT decision ordering an end to Kuwait Airways' unreasonable discrimination suggests related legal theories that might challenge the discriminatory practices we document. In the Kuwait Airways case, the location of discriminatory activity was critically important. The airline denied service to an Israeli in the US seeking to travel to the UK, two locations where Israel and Israeli passports were recognized. The location of the incident triggered anti-discrimination provisions of US transportation laws (49 US Code § 41310) as well as regulations promulgated by the US Department of Commerce (US DOC) pursuant to US anti-boycott laws (Sec. 3 of the US Export Administration Act of 1979, Pub. L. 96-72, 93 Stat. 503). Both overruled the airline's defense that domestic Kuwaiti law enacted pursuant to the Arab League's boycott against Israel and persons doing business with Israel required the denial of service.

Online route maps published by denier airlines like Saudia may also violate US law under a theory of unreasonably discriminatory practices taking place *in* the US. Saudia's maps may originate from a server in Jeddah but are re-produced repeatedly on servers and screens in the US. As in the Kuwait Airways case, the Saudia online route map omission of Israel follows from adherence to a domestic Saudi law enacted pursuant to the Arab League's anti-Israel boycott. But anti-discrimination provisions of US transportation laws prohibit such activity in the US if it is "unreasonable discrimination."<sup>40</sup> US anti-boycott provisions may prohibit such discriminatory practices by foreign firms and prohibit US firms from entering into agreements

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<sup>39</sup>For a detailed account of IBM's business relationship with the Nazi regime, see Black (2001).

<sup>40</sup>The US DOT repeatedly noted this legal standard in its September 30, 2015 ruling against Kuwait Airways. See <https://www.transportation.gov/sites/dot.gov/files/docs/Kuwait-Airways-Letter-Sept-30-2015.pdf>.

that further such practices. Anti-boycott provisions might apply not only to Saudia but also to its SkyTeam partner in the US, Delta Airlines, which assists in the dissemination of Saudia's denier route maps in, for example, Delta Airlines travel lounges as part of the US carrier's broader policy of accommodation.

Raising the cost of indulging owner tastes for discrimination through legal challenge may provide some relief in the short term. In the longer run, change in discriminatory practices like those we document comes when customer preferences and owner tastes change. Anti-Semitism is an age-old problem underpinned by attitudes that often seem to change only slowly if at all. But attitudes among customers and owners can change. 60 years ago, white customers in the American South were comfortable patronizing restaurants and hotels that explicitly discriminated against blacks. Today, such customer attitudes are unthinkable for the vast majority of Americans. Today, profit-oriented shareholders would almost certainly criticize (and seek legal relief in the form of a shareholder derivative suit) upon learning that the publicly-traded US firm it owns in part is engaged in racial discrimination. Perhaps those same institutional owners can also play a role in reducing the accommodation of anti-Semitic behavior by foreign business customers and allies. Such longer-term attitudinal trends raise the possibility of less discriminatory product differentiation as well as improved standards of business behavior in airlines and other global industries.

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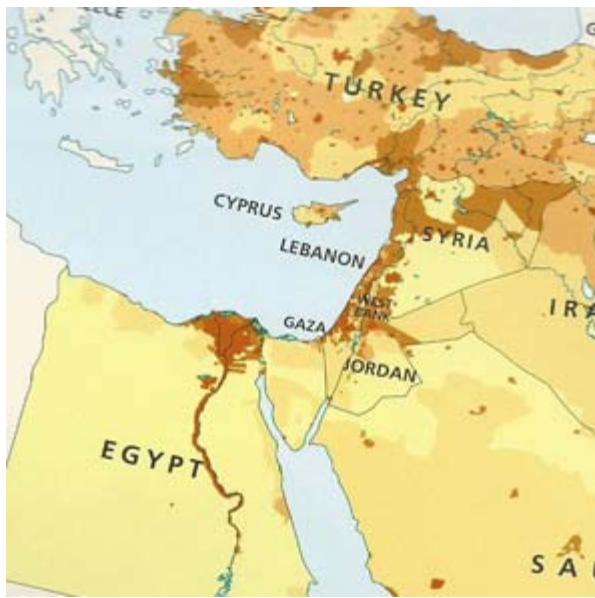
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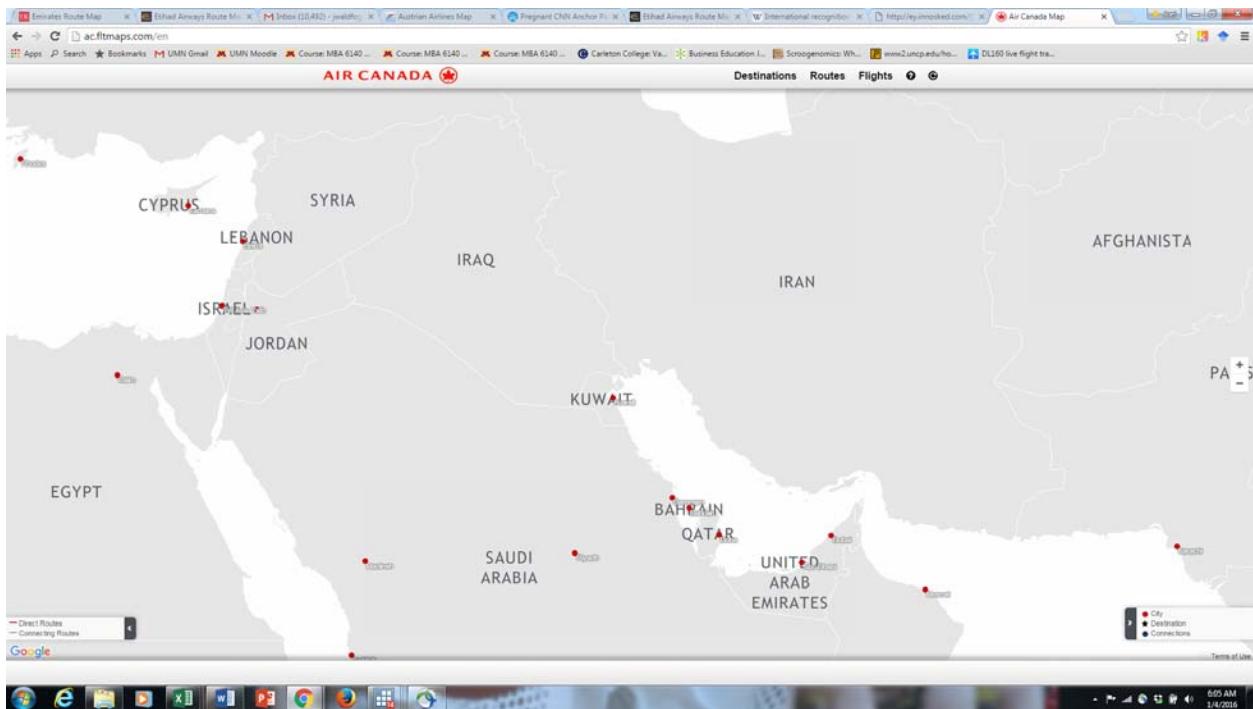
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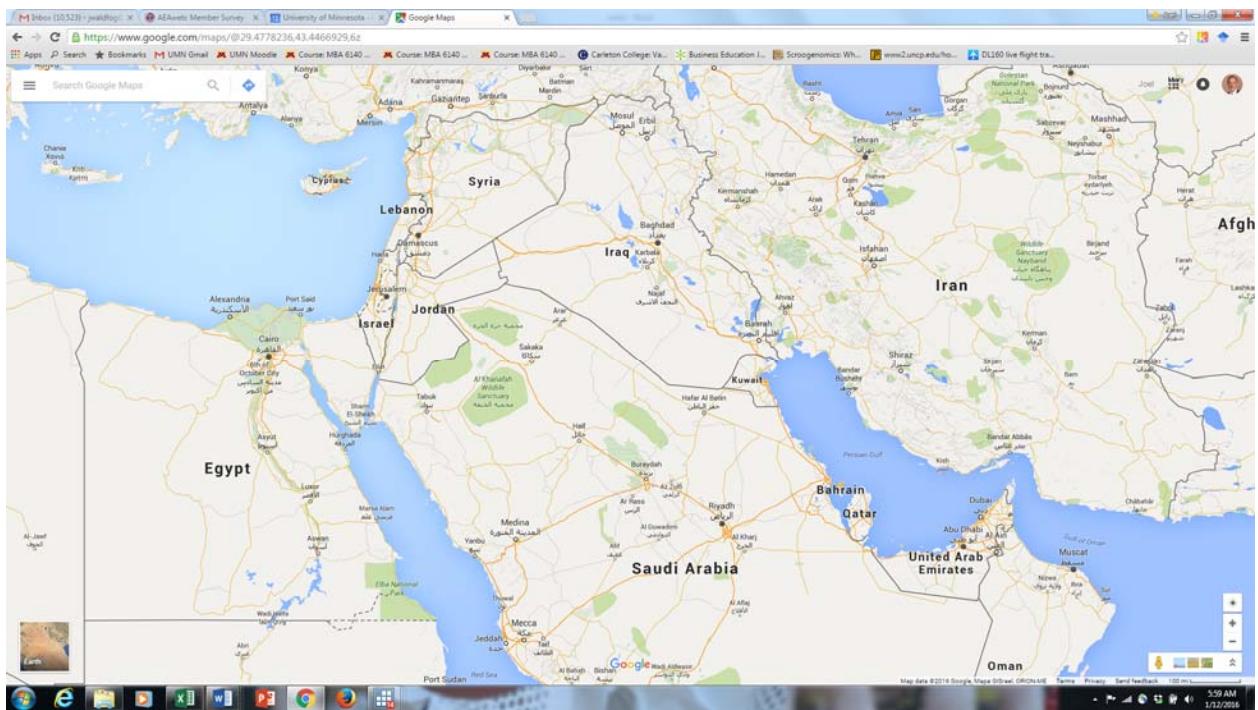
**Figure 1: Route map in HarperCollins atlas marketed to certain countries in 2015**



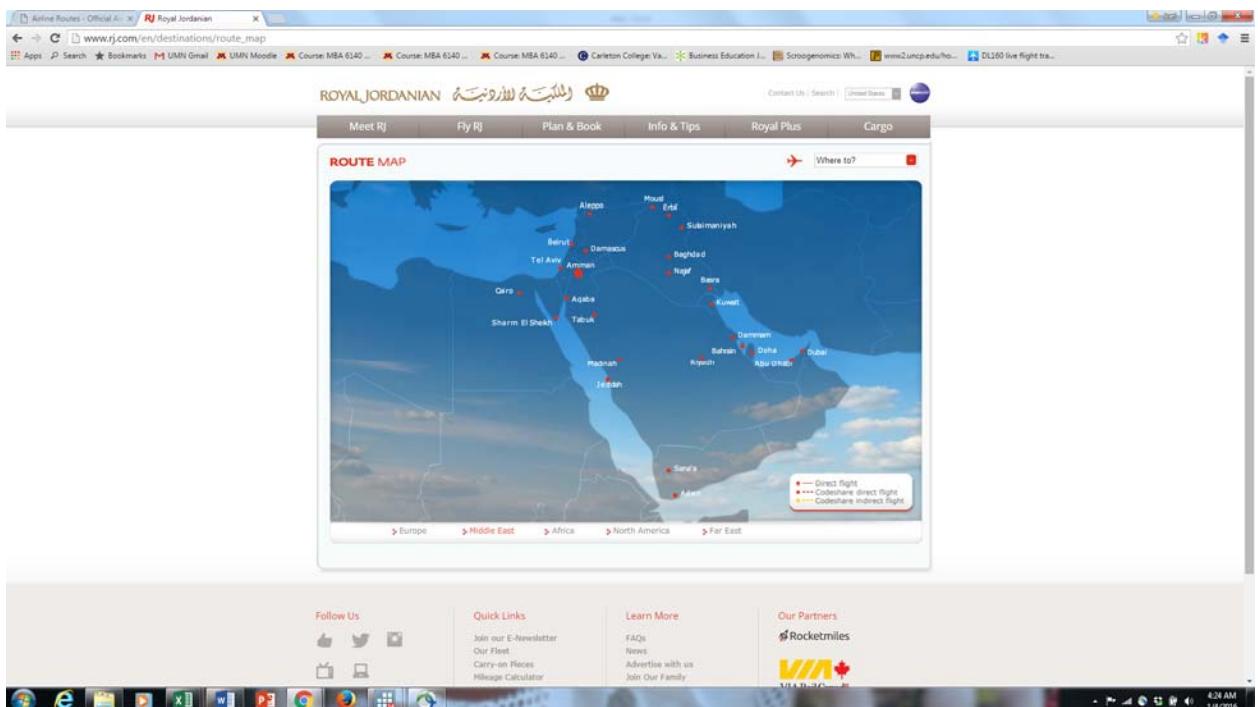
**Figure 2: Online route map for Air Canada**



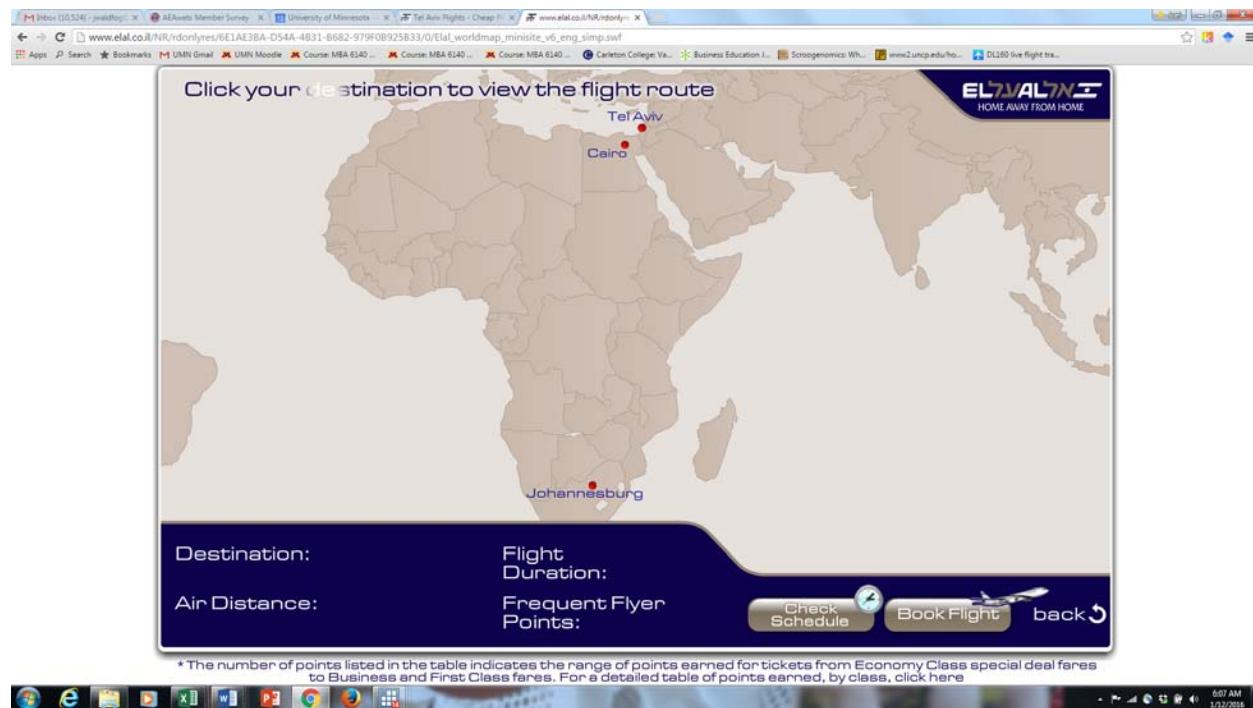
**Figure 3:** Standard online Google map of the Middle East



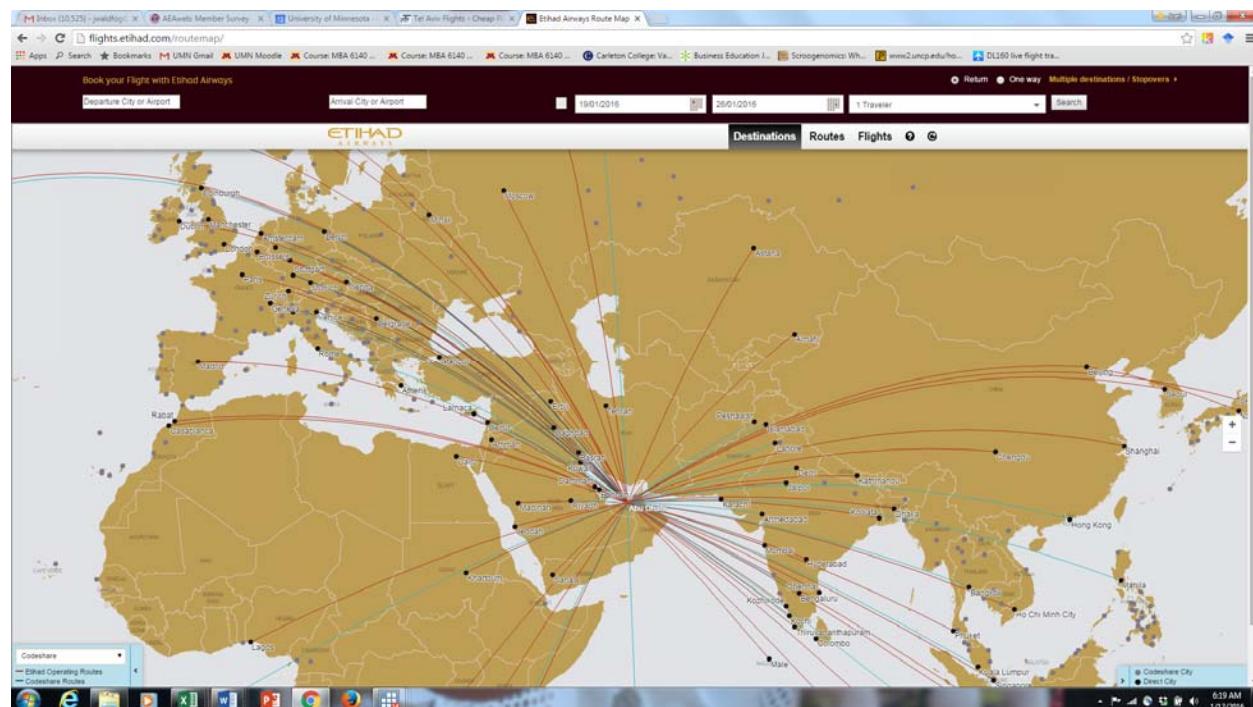
**Figure 4: Online route map for Royal Jordanian Airlines**



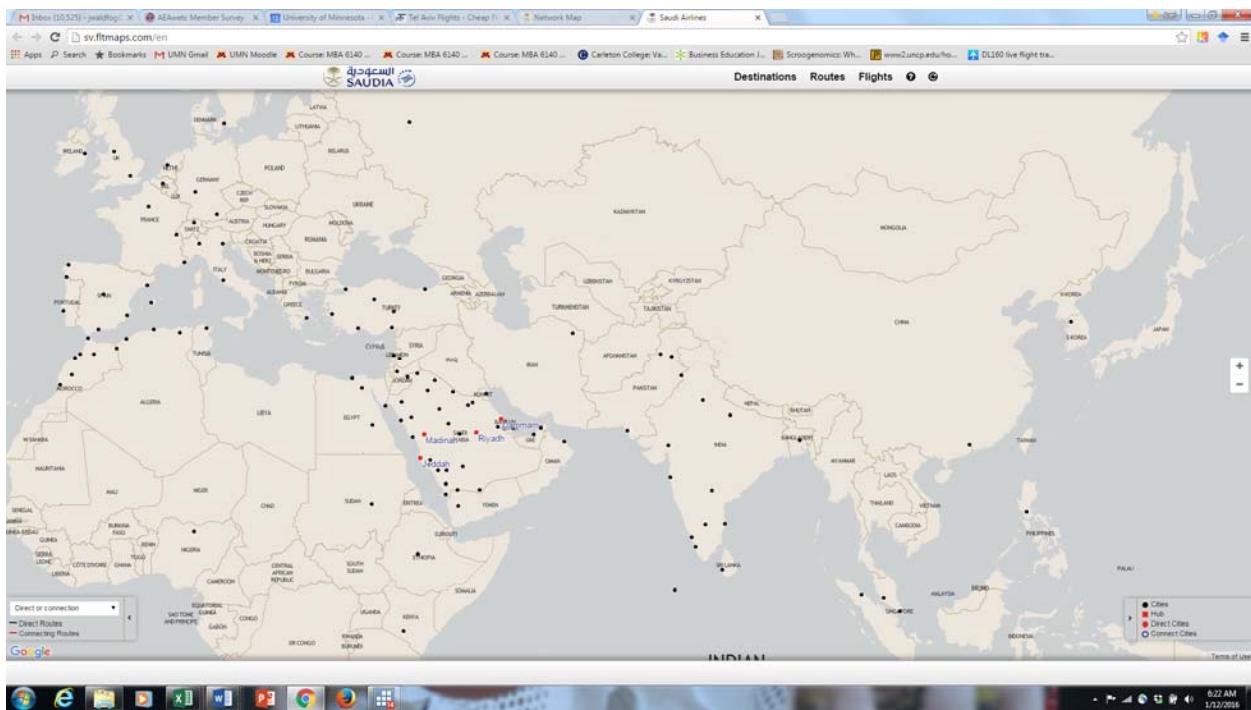
**Figure 5: Online route map for El Al Airlines**



**Figure 6: Online route map for Etihad Airways**



**Figure 7: Online route map for Saudia Airlines**



**Table 1: Means, standard deviations, and pairwise correlations for variables used in empirical analyses**

Variable	Mean	Std Dev	RMT	KMO	Alliance	CAS	CKI	SODR	Aircraft	Safety
<b>1. RMT</b>	2.5664	0.5958	<b>1</b>							
<b>2. KMO</b>	0.7750	0.4202	0.3470*	1						
<b>3. Alliance</b>	0.4474	0.4994	0.1106	0.2948*	1					
<b>4. CAS</b>	32.7976	18.9380	-0.4827*	-0.5824*	-0.2268*	1				
<b>5. CKI</b>	12.2672	13.2618	0.2173*	0.3213*	0.08	-0.5396*	1			
<b>6. SODR</b>	0.1491	0.3578	-0.6105*	-0.4118*	-0.129	0.4762*	-0.2045*	1		
<b>7. Aircraft</b>	4.0083	1.1946	0.0614	0.3367*	0.5286*	-0.3965*	0.2245*	-0.0623	1	
<b>8. Safety</b>	6.1226	1.1356	0.2303*	0.3191*	0.1962*	-0.4038*	0.3327*	-0.2976*	0.2852*	1

Table 1 reports sample means, standard deviations, and pairwise correlations for all variables used in empirical analyses reported in this study. The variables include: 1) airline online route map treatment (*RMT*), a 1-3 ordinal variable indicating denier (1), avoider (2) or embracer (3) regarding the treatment of Israel; 2) kosher meal options (*KMO*), a 0-1 categorical variable indicating whether an airline offers kosher meal options on online menus (1) or does not (0); and 3) airline alliance member (*Alliance*), a 0-1 categorical variable indicating whether an airline is a member of one of three major alliances (*i.e.*, Star, OneWorld or SkyTeam) (1) or not (0); 4) customer anti-Semitism (*CAS*), a 0-100 integral variable indicating the extent of anti-Semitic attitudes and practices of an airline's likely customers –higher values indicate greater anti-Semitism; 5) customer kosher interest (*CKI*), a 0-100 integral variable indicating the extent of searching on the word “kosher” by likely customers contacting airline online websites –higher values indicate greater kosher interest; and 6) state-owned airline located in a country that does not recognize Israel (*SODR*), a 0-1 categorical variable indicating whether an airline is majority state-owned and located in a country that does not recognize Israel (1) or not (0); 7) airline aircraft (*Aircraft*), the natural log of the number of aircraft in an airline fleet; and 8) airline safety (*Safety*), a 0-7 ordinal variable indicating airline adherence to various safety criteria set by regulatory agencies (*e.g.*, US Federal Aviation Authority) industry associations (*e.g.*, International Air Transport Association), and the *West Australian* newspaper compiling the safety ratings –higher values indicate greater safety. Other details on variable measures, sources and sampling are provided in Section 4 of the study. Significance levels: † =  $p < 0.10$ ; \* =  $p < 0.05$ ; \*\* =  $p < 0.01$ .

**Figure 8: Customer anti-Semitism (CAS) and Israel online route map treatment (RMT)**

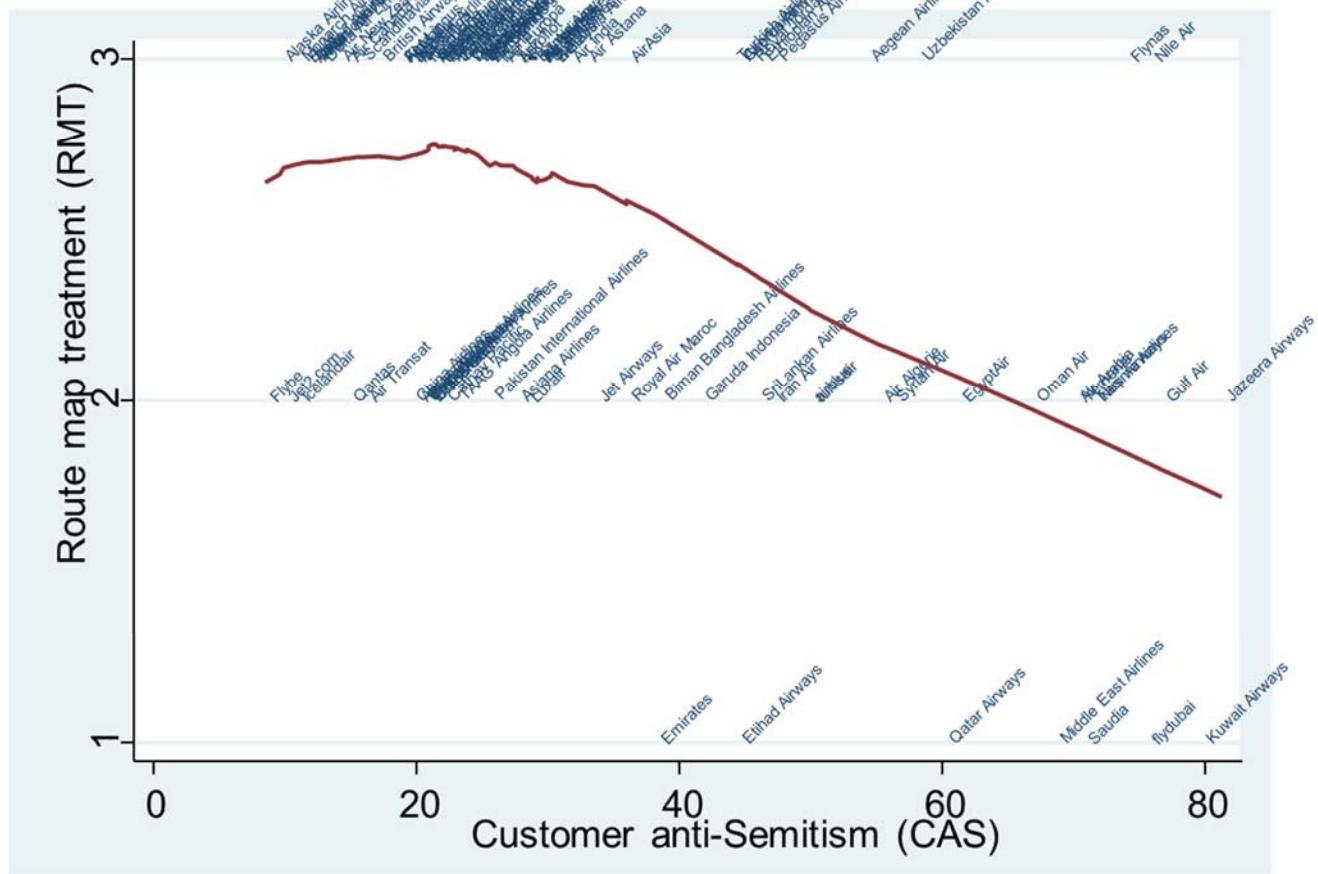


Figure 1 plots airline likely customer anti-Semitism (*CAS*) and online route map treatment (*RMT*) values, and then estimates a locally-weighted, scatter plot-smoothed (lowess) trend line based on these values. See Table 1 for summary description of *CAS* and *RMT*, and Section 4 of our study for more detailed description of each variable. We use Stata version 14.2 (StataCorp, 2015) and Stata’s “lowess” procedure to create Figure 8.

**Figure 9: Customer kosher interest (CKI) and online inflight menu kosher meal options (KMO)**

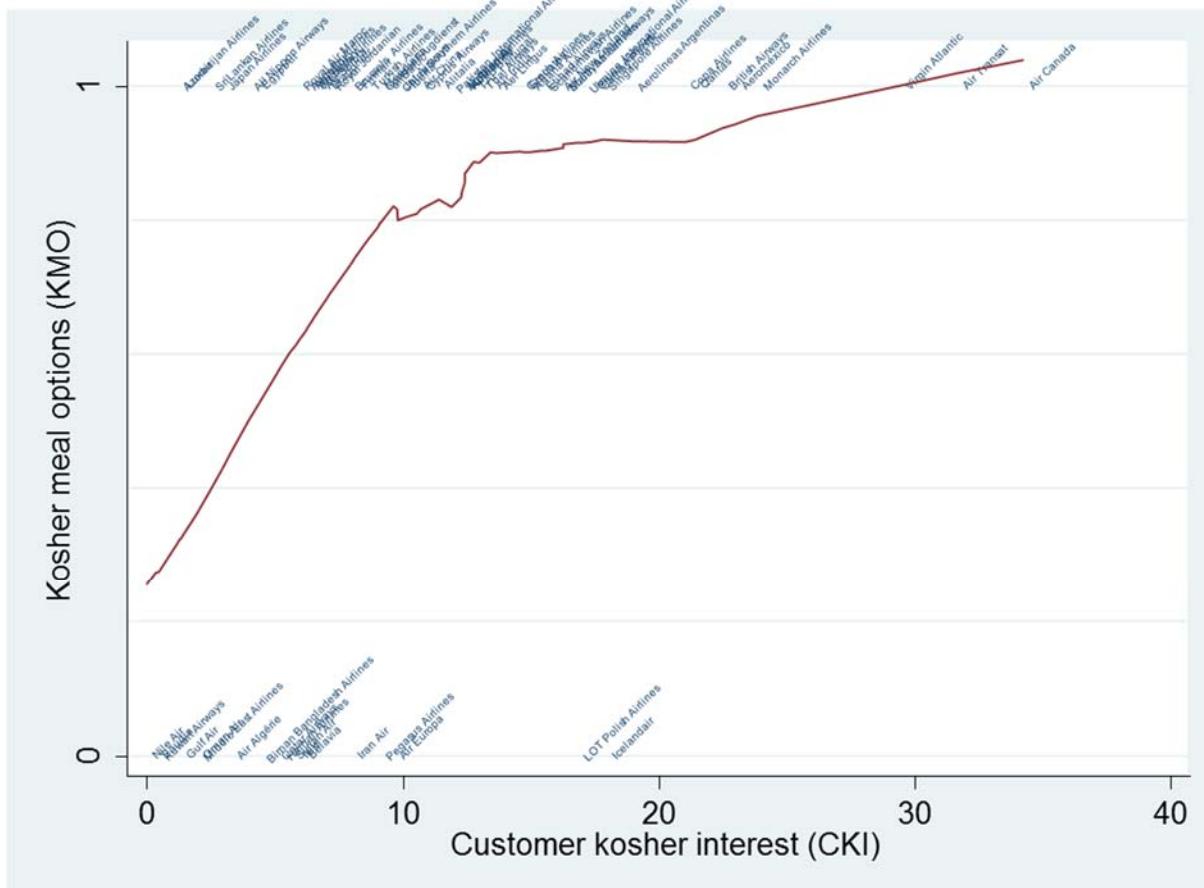


Figure 9 plots airline likely customer kosher interest (*CKI*) and online inflight menu kosher meal options (*KMO*) values, and then estimates a locally-weighted, scatter plot-smoothed (lowess) trend line based on these values. The lowess trend line analysis is truncated at the *CKI* value of 40 though *CKI* values can range from 0-100. A lowess trend line analysis with the full *CKI* value range is available from the authors. See Table 1 for summary description of *CKI* and *KMO*, and Section 4 of our study for more detailed description of each variable. We use Stata version 14.2 (StataCorp, 2015) and Stata's "lowess" procedure to create Figure 9.

**Figure 10: Embracer and non-embracer airlines and alliance membership**

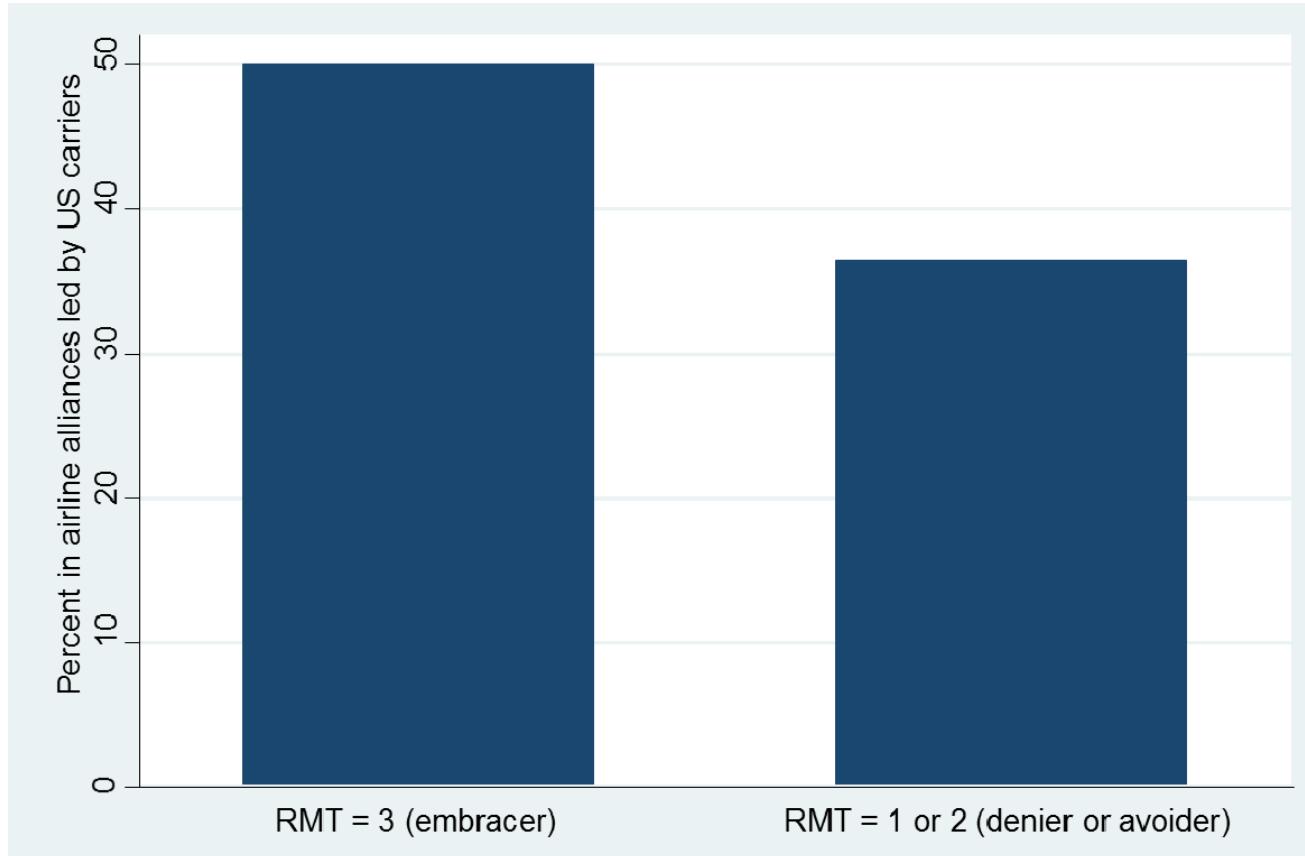


Figure 10 presents a bar chart indicating the percentage of embracer and non-embracer airlines with membership in major alliances including prominent US carriers: Star alliance including United Airlines; OneWorld alliance including American Airlines; or SkyTeam alliance including Delta Airlines. Approximately 50 percent of embracer airlines are members of one of these three alliances while approximately 37 percent of denier or avoider airlines are alliance members. See Table 1 for summary description of the *RMT* and *Alliance* variables, and Section 4 of our study for more detailed description of each variable used to generate this bar chart. We use Stata version 14.2 (StataCorp, 2015) and Stata's "bar graph" procedure to create Figure 10.

**Table 2: Ordered probit analysis of Israel online route map treatment (*RMT*)**

	(1)	(2)	(3)	(4)	(5)
<i>Customer anti-Semitism (CAS)</i>	-0.0196 (0.0079)*	-0.0189 (0.0080)*	-0.0211 (0.0084)*	-0.0207 (0.0083)*	-0.0219 (0.0087)*
<i>State owned &amp; does not recognize (SODR)</i>	-2.0182 (0.5002)**	-2.0157 (0.5047)**	-2.0112 (0.5003)**	-2.0480 (0.5085)**	-2.0242 (0.5174)**
<i>Alliance</i>		0.1487 (0.2643)			0.2827 (0.3044)
<i>Aircraft</i>			-0.0680 (0.1344)		-0.1294 (0.1568)
<i>Safety</i>				-0.0488 (0.1199)	-0.0383 (0.1224)
Cut-point	-3.3959 (0.5755)**	-3.3138 (0.5973)**	-3.7331 (0.8861)**	-3.7470 (1.0449)**	-4.1554 (1.1860)**
Cut-point	-1.1030 (0.2683)**	-1.0086 (0.3156)**	-1.4301 (0.7027)*	-1.4357 (0.8612)†	-1.8063 (1.0067)†
<i>N</i>	104	104	104	104	104

Table 2 reports ordered probit regression coefficient estimates and robust standard errors (in parentheses) for 104 international airlines operating in the first quarter of 2016. See Table 1 for summary description of the *RMT*, *CAS*, *SODR*, *Alliance*, *Aircraft*, and *Safety* variables, and Section 4 of our study for more detailed description of each variable used to obtain results. Significance levels: † =  $p < 0.10$ ; \* =  $p < 0.05$ ; \*\* =  $p < 0.01$ .

**Table 3: Probit analysis of online inflight menu kosher meal options (*KMO*)**

	(1)	(2)	(3)	(4)	(5)
<i>Customer kosher interest (CKI)</i>	0.0932 (0.0354)**	0.0854 (0.0353)*	0.0781 (0.0356)*	0.0879 (0.0364)*	0.0770 (0.0364)*
<i>State owned &amp; does not recognize (SODR)</i>	-1.0060 (0.4505)*	-0.8687 (0.4528)†	-0.9877 (0.4771)*	-0.9343 (0.4717)*	-0.9398 (0.4995)†
<i>Alliance</i>		0.6929 (0.3892)†			0.4316 (0.4230)
<i>Aircraft</i>			0.5263 (0.2490)*		0.4436 (0.2808)
<i>Safety</i>				0.1158 (0.2214)	-0.0291 (0.2518)
<i>Constant</i>	0.0437 (0.3897)	-0.2456 (0.4262)	-1.9652 (1.0234)†	-0.6429 (1.3710)	-1.6510 (1.5620)
<i>N</i>	77	77	77	77	77

Table 3 reports probit estimates and robust standard errors (in parentheses) for 77 international airlines operating in the first quarter of 2016. See Table 1 for summary description of the *KMO*, *CKI*, *SODR*, *Alliance*, *Aircraft*, and *Safety* variables, and Section 4 of our study for more detailed description of each variable used to obtain results. Significance levels: † =  $p < 0.10$ ; \* =  $p < 0.05$ ; \*\* =  $p < 0.01$ .

**Table 4: Fixed effects regression analysis of airline alliance membership (*Alliance*)**

	probit, no FE (1)	probit, no FE (2)	no FE (3)	continent FE (4)	region FE (5)	country FE (6)	country FE (7)
<i>Safety</i>	0.0155 (0.0526)	-0.1020 (0.0825)	0.0056 (0.0410)	0.0020 (0.0433)	-0.0025 (0.0479)	0.0058 (0.0994)	-0.1210 (0.1654)
<i>State owned &amp; does not recognize (SODR)</i>	-0.0976 (0.1717)	-0.2160 (0.2058)	-0.0700 (0.1339)	-0.0661 (0.1366)	-0.0089 (0.1491)	0.0784 (0.2497)	
<i>Aircraft</i>	0.3102 (0.0661)**	0.3154 (0.0828)**	0.2349 (0.0428)**	0.2460 (0.0457)**	0.2415 (0.0519)**	0.3223 (0.0754)**	0.3841 (0.0969)**
<i>Embracer</i>	0.1226 (0.1258)	0.1053 (0.1446)	0.0964 (0.1004)	0.1264 (0.1111)	0.0837 (0.1186)	0.1376 (0.1912)	0.2059 (0.2474)
<i>Kosher meal option (KMO)</i>		0.1499 (0.1668)					0.1889 (0.2460)
Constant			-0.5715 (0.2735)*	-0.6139 (0.2949)*	-0.5518 (0.3385)	-0.9835 (0.6415)	-0.5827 (1.0255)
<i>N</i>	104	77	104	104	104	104	77
<i>R</i> <sup>2</sup>			0.28	0.33	0.43	0.84	0.91

Table 4 reports probit coefficient estimates (as probability derivatives) using robust standard errors (in parentheses) in columns 1 and 2, and generalized least squares regression with robust standard errors (in parentheses) in columns 3 to 7 for up to 104 international airlines operating in the first quarter of 2016. Column 4 includes fixed effects for the continent where airlines are located. Column 5 includes fixed effects for the geographic region (defined by the UN) where airlines are located. Columns 6 and 7 include fixed effects for countries where airlines are located. See Table 1 for summary description of the *Alliance*, *Safety*, *SODR*, *Aircraft*, *Embracer* (*RMT* = 3) and *Kosher meal option* variables, and Section 4 of our study for more detailed description of each variable used to obtain results.

Significance levels: † =  $p < 0.10$ ; \* =  $p < 0.05$ ; \*\* =  $p < 0.01$ .

**Figure 11: Fleet size (*Aircraft*) and alliance membership (*Alliance*)**

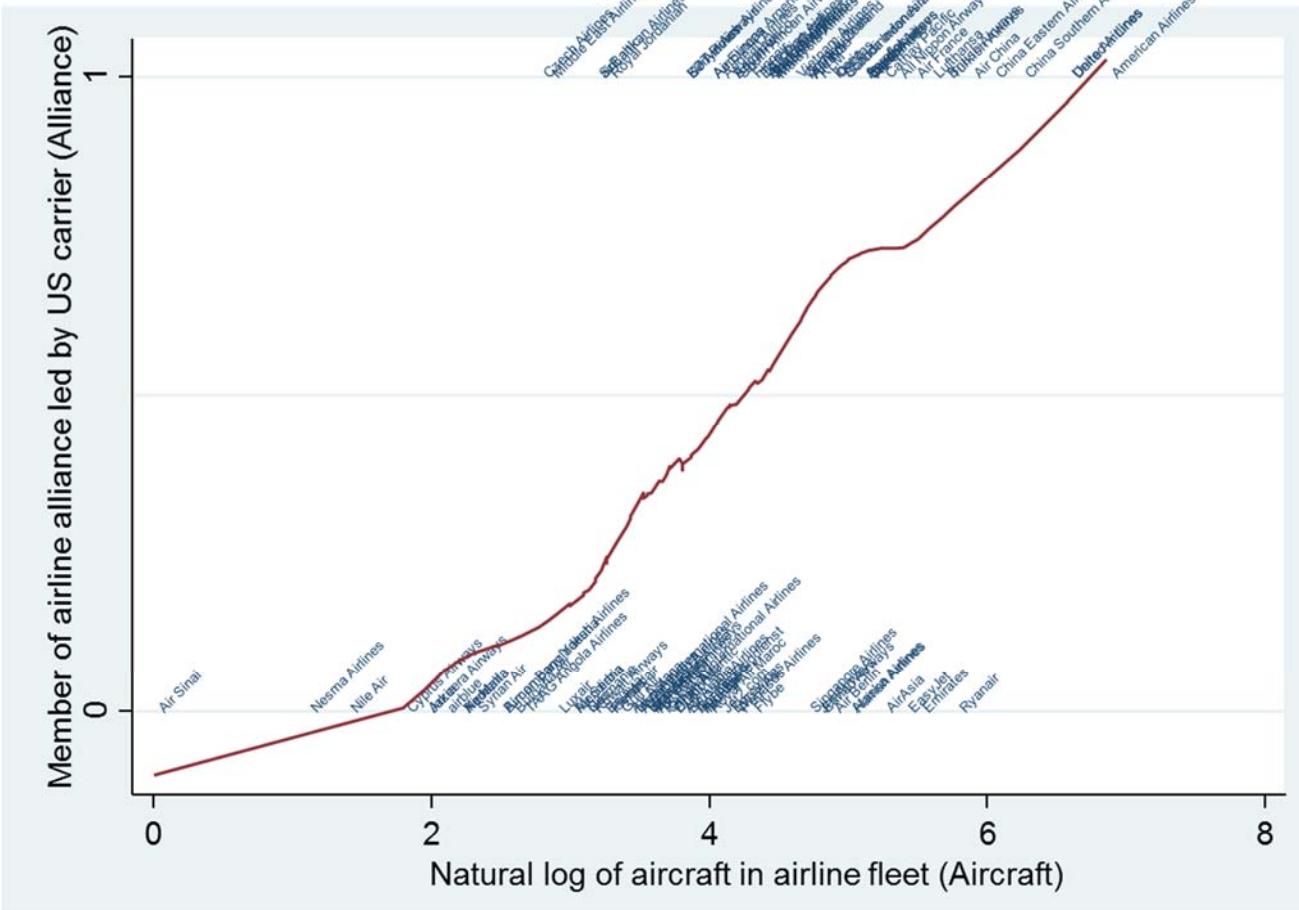


Figure 11 plots airline aircraft number (*Aircraft*) and membership in an alliance including a prominent US carrier (*Alliance*) values, and then estimates a locally-weighted, scatter plot-smoothed (lowess) trend line based on these values. See Table 1 for summary description of *Aircraft* and *Alliance*, and Section 4 of our study for more detailed description of each variable. We use Stata version 14.2 (StataCorp, 2015) and Stata's "lowess" procedure to create Figure 11.

**Table 5: Current and potential Middle East alliance partners for prominent US carriers**

International Airline Name	Fleet Size	Safety Rating	Alliance Membership	Home Country	Online Route Map Treatment Mode
Turkish Airlines	299	6	Yes: Star	Turkey	Embracer
Emirates	245	7	No	United Arab Emirates	(Plausible) Denier
Qatar Airways	167	5	Yes: OneWorld	Qatar	(Intentional) Denier
Saudia	163	7	Yes: SkyTeam	Saudi Arabia	(Intentional) Denier
Air Arabia	44	7	No	United Arab Emirates	Avoider
Pegasus Airlines	66	7	No	Turkey	Embracer
Flydubai	50	5	No	United Arab Emirates	(Intentional) Denier
Etihad Airways	119	7	No	United Arab Emirates	(Plausible) Denier
Egypt Air	63	5	Yes: Star	Egypt	Avoider
Iran Air	51	5	No	Iran	Avoider
Royal Jordanian	26	5	Yes: OneWorld	Jordan	Avoider
Azerbaijan Airlines	32	5	No	Azerbaijan	Embracer
El Al	41	7	No	Israel	Avoider
Oman Air	39	6	No	Oman	Avoider
Gulf Air	28	5	No	Bahrain	Avoider
Iraqi Airways	31	2	No	Iraq	Avoider
Middle East Airlines	17	5	Yes: SkyTeam	Lebanon	(Intentional) Denier
Kuwait Airways	23	7	No	Kuwait	(Intentional) Denier
Yemenia	9	4	No	Yemen	Avoider
Arkia	7	7	No	Israel	Embracer
Flynas	26	5	No	Saudi Arabia	Embracer
Jazeera Airways	7	7	No	Kuwait	Avoider
Syrian Air	10	5	No	Syria	Avoider
Nile Air	4	None	No	Egypt	Embracer
Air Sinai	1	None	No	Egypt	Embracer
Nesma Airlines	3	None	No	Egypt	Avoider

Table 5 reports airline names and related data relevant to assessment as a current or potential Middle Eastern partner in an alliance including United Airlines (Star), American Airlines (OneWorld) or Delta Airlines (SkyTeam). The data are current to the first quarter of 2016. We list airlines located in countries considered to be from “Western Asia” by the UN ( see, e.g., <http://www.unep.org/tunza/tunzachildren/downloads/country-Classification.pdf>). Fleet size estimates come from Wikipedia entries for each airline. Airline safety ratings run from 1 (lowest) to 7 (highest) (<http://www.airlineratings.com/airlines-ratings.php>). Status as alliance member is based on review of Star, OneWorld and SkyTeam alliance member lists published at alliance websites as of the first quarter of 2016.

## Appendix 1: List of international airlines included in study

<b>International Airline Name</b>	<b>Home Country</b>	<b>Online Route Map Treatment Mode</b>
Aegean Airlines	Greece	Embracer
Aer Lingus	Ireland	Embracer
Aeroflot	Russia	Embracer
Aerolíneas Argentinas	Argentina	Embracer
Aeroméxico	Mexico	Avoider
Air Algérie	Algeria	Avoider
Air Arabia	United Arab Emirates	Avoider
Air Astana	Kazakhstan	Embracer
Air Berlin	Germany	Embracer
Air Canada	Canada	Embracer
Air China	China	Embracer
Air Europa	Spain	Embracer
Air France	France	Embracer
Air India	India	Embracer
Air Malta	Malta	Embracer
Air New Zealand	New Zealand	Embracer
Air Serbia	Serbia	Embracer
Air Transat	Canada	Avoider
AirAsia	Malaysia	Embracer
AirBaltic	Latvia	Embracer
Airblue	Pakistan	Avoider
Alaska Airlines	United States	Embracer
Alitalia	Italy	Embracer
All Nippon Airways	Japan	Embracer
American Airlines	United States	Embracer
Arkia	Israel	Embracer
Asiana Airlines	Korea	Avoider
Austrian Airlines	Austria	Embracer
Azerbaijan Airlines	Azerbaijan	Embracer
Belavia	Belarus	Embracer
Biman Bangladesh Airlines	Bangladesh	Avoider
British Airways	United Kingdom	Embracer
Brussels Airlines	Belgium	Embracer
Bulgaria Air	Bulgaria	Embracer
Cathay Pacific	China	Avoider
China Airlines	Taiwan	Avoider
China Eastern Airlines	China	Avoider
China Southern Airlines	China	Avoider
Condor Flugdienst	Germany	Embracer
Copa Airlines	Panama	Embracer

<b>Cyprus Airways</b>	Cyprus	Embracer
<b>Czech Airlines</b>	Czech Republic	Embracer
<b>Delta Air Lines</b>	United States	Embracer
<b>Dragonair</b>	China	Avoider
<b>EasyJet</b>	United Kingdom	Embracer
<b>EgyptAir</b>	Egypt	Avoider
<b>El Al</b>	Israel	Avoider
<b>Emirates</b>	United Arab Emirates	(Plausible) Denier
<b>Ethiopian Airlines</b>	Ethiopia	Embracer
<b>Etihad Airways</b>	United Arab Emirates	(Plausible) Denier
<b>Eurowings</b>	Germany	Embracer
<b>Finnair</b>	Finland	Embracer
<b>Flybe</b>	United Kingdom	Avoider
<b>Flydubai</b>	United Arab Emirates	(Intentional) Denier
<b>Flynas</b>	Saudi Arabia	Embracer
<b>Garuda Indonesia</b>	Indonesia	Avoider
<b>Germania</b>	Germany	Embracer
<b>Gulf Air</b>	Bahrain	Avoider
<b>Hainan Airlines</b>	China	Embracer
<b>Iberia</b>	Spain	Embracer
<b>Icelandair</b>	Iceland	Avoider
<b>Iran Air</b>	Iran	Avoider
<b>Iraqi Airways</b>	Iraq	Avoider
<b>Japan Airlines</b>	Japan	Embracer
<b>Jazeera Airways</b>	Kuwait	Avoider
<b>Jet Airways</b>	India	Avoider
<b>Jet2.com</b>	United Kingdom	Avoider
<b>Kenya Airways</b>	Kenya	Embracer
<b>KLM</b>	Netherlands	Embracer
<b>Kuwait Airways</b>	Kuwait	(Intentional) Denier
<b>LOT Polish Airlines</b>	Poland	Embracer
<b>Lufthansa</b>	Germany	Embracer
<b>Luxair</b>	Luxembourg	Avoider
<b>Malaysia Airlines</b>	Malaysia	Embracer
<b>Meridiana</b>	Italy	Embracer
<b>Middle East Airlines</b>	Lebanon	(Intentional) Denier
<b>Monarch Airlines</b>	United Kingdom	Embracer
<b>Neos</b>	Italy	Embracer
<b>Nesma Airlines</b>	Egypt	Avoider
<b>Niki</b>	Germany	Embracer
<b>Nile Air</b>	Egypt	Embracer
<b>Oman Air</b>	Oman	Avoider
<b>Pakistan Int'l Airlines</b>	Pakistan	Avoider

<b>Pegasus Airlines</b>	Turkey	Embracer
<b>Qantas</b>	Australia	Avoider
<b>Qatar Airways</b>	Qatar	(Intentional) Denier
<b>Royal Air Maroc</b>	Morocco	Avoider
<b>Royal Jordanian</b>	Jordan	Embracer
<b>Ryanair</b>	Ireland	Embracer
<b>S7 Airlines</b>	Russia	Embracer
<b>Saudia</b>	Saudi Arabia	(Intentional) Denier
<b>Scandinavian Airlines</b>	Sweden	Embracer
<b>Singapore Airlines</b>	Singapore	Avoider
<b>South African Airways</b>	South Africa	Embracer
<b>SriLankan Airlines</b>	Sri Lanka	Avoider
<b>Swiss Int'l Air Lines</b>	Switzerland	Embracer
<b>Syrian Air</b>	Syria	Avoider
<b>TAAG Angola Airlines</b>	Angola	Avoider
<b>TAP Portugal</b>	Portugal	Embracer
<b>Thai Airways</b>	Thailand	Avoider
<b>Transavia</b>	Netherlands	Embracer
<b>Tunisair</b>	Tunisia	Avoider
<b>Turkish Airlines</b>	Turkey	Embracer
<b>Ukraine Int'l Airlines</b>	Ukraine	Embracer
<b>United Airlines</b>	United States	Embracer
<b>Ural Airlines</b>	Russia	Embracer
<b>Uzbekistan Airways</b>	Uzbekistan	Embracer
<b>Vietnam Airlines</b>	Vietnam	Avoider
<b>Virgin Atlantic</b>	United Kingdom	Embracer
<b>Wizz Air</b>	Hungary	Embracer
<b>Yemenia</b>	Yemen	Avoider