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The integration penalty: Impact of 9/11 on the Muslim marriage market

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Abstract
Major sociopolitical events can have lasting impacts on integration through changing marriage preferences. Marriage markets, due to their unregulated nature, both reflect and affect integration in society. I use 9/11 as a natural experiment that altered preferences for interethnic marriage without changing the demographic compositions. Using a difference-in-differences framework com-paring American Muslims to other ethnic minorities, I find that 9/11 reduced Muslim intermarriage rates by 8 percentage points, primarily through decreased marriages with White Americans. I develop a novel model that analyses how individuals trade-off between group identity and other partner characteristics in marriage decisions, providing a framework to compare intermarriage disutilities through compensating differentials in the marriage market. I find that barriers to intermarriage stem primarily from non-Muslim Americans rather than Muslims.

Key words: marriage market, intermarriage, social integration, Muslims
JEL: J12; J15; J71

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1 Introduction

Social integration is a key determinant of economic mobility through its role in facilitating access to social capital, information networks, and economic opportunities (Alba and Nee, 2003). Despite its importance, minority groups often encounter substantial barriers in integration. Through a novel intermarriage model, I show that American Muslims show greater willingness to marry outside their ethnic group compared to other minorities, yet, face higher resistance to intermarriage from the majority population. The 9/11 terrorist attacks, as an exogenous shock to preferences for social mixing, reduced their probability of intermarriages by 8 percentage points; impeding their integration into society.

The integration of Muslims in Western societies has gained particular significance due to heightened political attention and documented rise in Islamophobia across Western countries (Helbling, 2012). Muslims are the world's second-largest religious group, comprising about 25% of the global population, and they are the fastest-growing worldwide. While Muslims in Western countries often show distinct patterns of economic and social integration compared to other minority groups (Bisin et al., 2008; Adida et al., 2016; Farahzadi, 2024), American Muslims were experiencing high levels of cultural integration (Haddad and Esposito, 2000). However, their integration slowed down after 9/11 (Gould and Klor, 2016).

The marriage market provides a unique lens for studying social integration, as it remains largely unregulated compared to labour markets and better reflects personal preferences (Fryer Jr, 2007; Meng and Gregory, 2005). Intermarriage patterns are particularly informative as they serve both as indicators and drivers of integration (Gordon, 1964; Kalmijn, 1998; Furtado and Song, 2022). However, the empirical study of marriage markets through reduced-form analysis presents significant challenges due to their general equilibrium nature. Changes in economic conditions, education policies, or migration patterns typically influence both the pool of potential partners and individuals' preferences, making it difficult to isolate causal effects.

The events of 9/11 present a unique identification opportunity because they constitute a rare shock that primarily affected preferences for inter-group marriage, particularly between Muslim and non-Muslim individuals, while leaving other market characteristics, such as population composition, unchanged. This setting enables clear identification of how social preferences influence marriage market equilibrium. While existing studies explore the economic and social impacts of 9/11 on Muslim communities, I provide the first comprehensive analysis of how an exogenous shock

to social preferences affects intermarriage patterns along both extensive and intensive margins. Specifically, I analyse changes in both the frequency of intermarriage and the socioeconomic characteristics of intermarried couples, offering novel evidence on these dual effects.

I develop an intermarriage model that formalizes how individuals trade off between group identity and other characteristics in their marriage decisions. In this framework, marriage utility is determined by observable characteristics (such as socioeconomic status), group membership, and idiosyncratic taste shocks. When individuals face an intermarriage disutility from marrying outside their group, they will only do so if potential partners has sufficiently valuable observable or unobservable attributes to offset the intermarriage disutility. The model predicts that groups facing higher intermarriage disutility will marry spouses with higher educational attainment in intermarriages compared to intra-group marriages. Larger differentials signal stronger resistance to intermarriage. Hence, this framework enables comparison of intermarriage disutility across different groups.

A rise in intermarriage disutility for either group will reduce overall intermarriage rates. However, changes in the compensating differentials—the tradeoffs people make between group identity and other characteristics—depend specifically on how the relative disutility between groups changes. For example, if both groups experience an equal increase in intermarriage disutility, the tradeoffs remain unchanged, while unequal changes in disutility will alter the marriage market equilibrium.

To empirically test these predictions, I use a difference-in-differences approach to examine how intermarriage rates and trade-offs changed for Muslims relative to other minority groups. Leveraging 9/11 as an unexpected shock to social attitudes, this methodology allows me to isolate the causal effect of changing preferences by comparing Muslim intermarriage patterns to those of similar minority groups who were not directly affected.

I analyse marriages that occurred between 1990 and 2015 using American Community Survey (ACS) data. The ACS is particularly suited for this analysis as it records the year of each marriage, enabling me to study how marriage patterns evolve over time rather than just observing the existing stock of marriages at a single point. In contrast to Gould and Klor (2016), I restrict my analysis to US-born individuals for two reasons. First, this restriction eliminates potential confounding effects from post-9/11 changes in immigration laws. Second, US-born individuals face fewer cultural and linguistic barriers, allowing for clearer identification of how social attitudes shape

marriage market outcomes independent of other integration challenges.

Since the ACS does not collect information on religious affiliation, I identify Muslims through ancestry from Muslim-majority countries. This approach follows the empirical strategy used in previous studies (Davila and Mora, 2005; Gould and Klor, 2016; Adida et al., 2016) which show that in Western societies, individuals from Muslim-majority countries are commonly perceived as Muslim based on observable characteristics such as ethnic background, languages, and names, regardless of their actual religious beliefs.

The findings show a significant shift in intermarriage patterns for Muslims following 9/11, reflecting increased barriers to integration. Muslim intermarriage rates declined by 8 percentage points relative to other minority groups, with an even sharper 11 percentage points drop in marriages with White Americans. Hence, fewer Muslims married White Americans, with a corresponding increase in marriages to individuals from other ethnic minority groups. Notably, the decline in intermarriage rates was not driven by lower marriage rates or higher divorce rates, but rather by a shift from out-group towards in-group marriages. Furthermore, these changes were accompanied by a negative impact on selection into intermarriage after 9/11. Individuals who intermarried after 9/11 had lower average education levels than those who intermarried before.

Non-Muslims who marry Muslims match with more educated partners compared to those who marry within their group, reflecting higher intermarriage disutility that requires compensation through spousal education. In contrast, Muslims show approximately assortative matching on education whether they marry within or outside their group, suggesting they face lower intermarriage disutility. This pattern persisted after 9/11, indicating that while the attacks increased overall intermarriage disutility, they did not substantially alter the relative disutility between Muslims and non-Muslims.

These results demonstrate how social attitudes can create substantial barriers to integration through marriage markets, even in the absence of formal institutional discrimination. The results suggest that barriers to Muslim integration stem primarily from non-Muslims' higher disutility from intermarriage, rather than Muslims' resistance to integration. These marriage market dynamics can have long-lasting effects on social integration, as marriage patterns influence the next generation's exposure to different cultures, social networks, and economic opportunities. The results highlight the importance of policies aimed at fostering positive inter-group relations and countering discriminatory attitudes, as social preferences in marriage markets can

significantly impact minority groups' long-term economic and social mobility.

My study contributes to several strands of the literature. First, while existing research documents various economic impacts of 9/11 on Muslim communities, including labour market discrimination, residential segregation, health and social outcomes of immigrants (Davila and Mora, 2005; Kaushal et al., 2007; Ahmed and Hammarstedt, 2008; Gautier et al., 2009; Cornelissen and Jirjahn, 2012; Johnston and Lordan, 2012; Gould and Klor, 2016), I provide the first comprehensive analysis of how 9/11 affected both the quantity of intermarriage and the trade-offs in partner selection.

I also contribute to the marriage market literature by providing rare empirical evidence of how changes in preferences alone affect matching patterns in a multidimensional setting. Studies of multidimensional matching show how individuals trade off different partner characteristics (Chiappori et al., 2012, 2016, 2018), but identifying causal effects of preference changes remains challenging due to the general equilibrium nature of marriage markets. I provide novel causal evidence of how changes in social attitudes influence these trade-offs across multiple dimensions of partner characteristics, including ethnicity, education, and immigrant status. In addition, I develop a methodological framework to compare groups' relative preferences for mixing.

Finally, I contribute to the broader literature on discrimination and social integration. While most studies focus on formal labour market discrimination where legal protections exist (Bertrand and Mullainathan, 2004; Charles and Guryan, 2008; Fryer Jr and Torelli, 2010), I examine discrimination in social markets where preferences can be expressed more freely (Fryer Jr, 2007; Meng and Gregory, 2005). By introducing a novel method to compare groups' relative preferences for mixing in marriage markets, I demonstrate how discriminatory attitudes create barriers to integration through social channels that are harder to regulate.

The paper is structured as follows. Section 2 introduces the model. Section 3 describes the data sources, presents the methodology for identifying Muslims in the dataset, and provides key stylized facts about Muslim marriage market in the US. Section 4 examines the extensive margin, analysing how 9/11 affected both the frequency of Muslim intermarriage and sorting patterns. Section 5 studies the intensive margin by measuring changes in marriage market trade-offs. Finally, Section 6 concludes.

2 The Model

The intermarriage trade-off concept was initially introduced by Merton (1941) and Davis (1941) through the formulation of social exchange theory. This theory posits that individuals approach relationships as exchanges where they weigh costs and benefits, suggesting that people may compensate for crossing racial or ethnic boundaries by offering other valued attributes in marriage. Subsequent studies by Galichon and Salanié (2010), Chiappori et al. (2012), and Chiappori et al. (2018) further model trade-offs in matching models by developing formal frameworks where individuals match based on multiple characteristics simultaneously. In this section, I introduce a simple model of intermarriage that explains the main mechanisms and how people trade-off characteristics in an intermarriage.

Consider a population of men and women,[1] where each individual is characterized by two attributes: their socioeconomic status (s) and their group (r). For simplicity, I assume r is a binary variable equal to $\{1, 2\}$ denoting group membership between two groups.[2] Each woman i is described by the pair (s_i, r_i), where $s_i \sim H^w_{r_i}$ follows a group-specific distribution of socioeconomic status for females. Similarly, each man j is described by (s_j, r_j), where $s_j \sim H^m_{r_j}$ follows the corresponding male-specific distribution. The superscripts w and m denote female and male distributions, which may differ within the same group.

The utility of marriage consists of two components: a deterministic term and a stochastic term. The deterministic term captures both the returns to partners' socioeconomic characteristics and a disutility for cross-group marriages, while the stochastic term reflects group-specific idiosyncratic taste shocks. Formally, for a potential match between woman i and man j:

$$\text{Woman } i\text{'s utility: } U_{ij} = f(s_i, s_j) - \lambda^w_{r_i}\mathbf{1}(r_i \neq r_j) + \varepsilon_{i,r_j}$$
$$\text{Man } j\text{'s utility: } V_{ji} = g(s_j, s_i) - \lambda^m_{r_j}\mathbf{1}(r_j \neq r_i) + \eta_{j,r_i}$$

The functions $f(s_i, s_j)$ and $g(s_j, s_i)$ represent the systematic returns to socioeconomic characteristics for women and men, respectively. These functions are assumed to be continuous and twice differentiable, with positive first derivatives, reflecting that higher socioeconomic status of either partner increases marriage utility. Following standard assumptions in the matching literature (Chiappori et al., 2012, 2018),

[1] Due to data limitations, this analysis focuses exclusively on heterosexual marriages.

[2] The group attribute (r) can represent any characteristic that segments individuals into distinct subpopulations, such as ethnicity, religious affiliation, or caste.

these functions are also assumed to exhibit complementarity in partner characteristics ($\partial^2 f/\partial s_i \partial s_j > 0, \partial^2 g/\partial s_i \partial s_j > 0$), meaning that the marginal return to one's partner's socioeconomic status increases with one's own status.

The parameters $\lambda^w_{r_i}$ and $\lambda^m_{r_j}$ capture the group and gender specific disutility from marrying outside one's group, where $\mathbf{1}(r_i \neq r_j)$ is an indicator function equal to 1 for intermarriages. The assumption of intermarriage disutility is supported by extensive empirical evidence documenting strong preferences for homogamy across ethnic, religious, and cultural dimensions (Kalmijn, 1998; Wong, 2003; Bisin et al., 2004; Fryer Jr, 2007; Hitsch et al., 2010). Studies consistently show that individuals demonstrate marked tendencies toward intra-group marriage, reflecting both social preferences and structural constraints in marriage markets. However, the model imposes no restrictions on the intermarriage disutility parameter (λ), allowing it to take negative values that would capture preferences for out-group marriage.

The terms ε_{i,r_j} and η_{j,r_i} are idiosyncratic group-specific taste shocks, drawn independently from a continuous distribution $\Phi(\cdot)$. I assume $\Phi(\cdot)$ follows the same distribution for both groups and both genders, with zero mean and finite variance. The assumption of identical distributions across groups is crucial for identification of relative preferences, as it ensures that systematic differences in matching patterns reflect differences in intermarriage disutility (λ) rather than heterogeneity in the distribution of unobservable preferences.

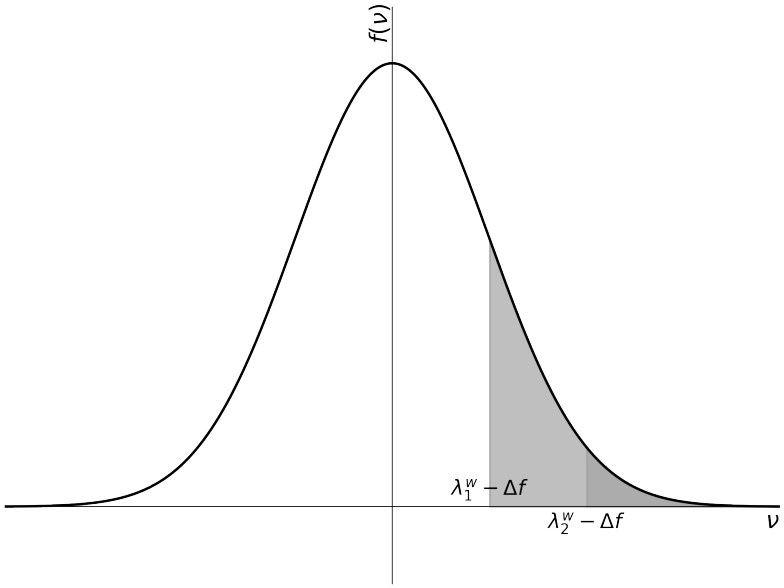
Consider woman i from group 1 choosing between two potential partners: man k from group 1 ($r_i = r_k$) with socioeconomic status s_k, and man m from group 2 ($r_i \neq r_m$) with socioeconomic status s_m. She optimally chooses intermarriage (i.e., matches with m) if and only if $U_{im} > U_{ik}$. This choice condition can be expressed as:

$$\lambda^w_1 < f(s_i, s_m) - f(s_i, s_k) + \varepsilon_{i,2} - \varepsilon_{i,1}$$

This inequality reveals the fundamental trade-off in intermarriage decisions: individuals intermarry only when the group-specific disutility of intermarriage (λ^w_1) is outweighed by the sum of two compensating differentials. The first is the difference in gains from socioeconomic status ($f(s_i, s_m) - f(s_i, s_k)$), and the second is the difference in match-specific taste shocks ($\varepsilon_{i,2} - \varepsilon_{i,1}$), which captures effect of all unobservable valuable attributes in the marriage market. The probability that woman i from group 1 intermarries can thus be expressed as:

$$P_1(\text{Intermarriage}|s_i)$$
$$= P(\exists m \in \text{group } 2 : \lambda_1^w < f(s_i, s_m) - f(s_i, s_k) + \varepsilon_{i,2} - \varepsilon_{i,1}, \forall k \in \text{group } 1)$$

Figure 1. Random Taste Shocks and Intermarriage



Notes. The figure shows distribution of the difference between taste shocks $\nu_i = \varepsilon_{i,g_m} - \varepsilon_{i,g_k}$, where ε_{im} is the taste shock for out-group partner m and ε_{ik} is the taste shock for same-group partner k. $\Delta f = f(s_i, s_m) - f(s_i, s_k)$ represents the difference in utility from socioeconomic status between marrying an out-group partner m versus a same-group partner k.

For a given pair of socioeconomic status values s_k and s_m, the probability of intermarriage can be expressed as $1 - \tilde{\Phi}(\lambda_1^w - (f(s_i, s_m) - f(s_i, s_k)))$, where $\tilde{\Phi}(\cdot)$ is the distribution of the difference in taste shocks $(\varepsilon_{i,2} - \varepsilon_{i,1})$. The shaded region in Figure 1 represents the proportion of individuals whose net match quality differential $(\varepsilon_{i,2} - \varepsilon_{i,1})$ exceeds the threshold determined by the intermarriage disutility. An increase in the group-specific intermarriage disutility (λ_1^w) shifts this threshold rightward, thereby reducing the proportion of individuals who optimally choose cross-group marriages. When potential partners differ in their socioeconomic status, intermarriage becomes optimal through two distinct channels: either through sufficiently large differences in unobservable match quality $(\varepsilon_{i,2} - \varepsilon_{i,1})$, or through compensating socioeconomic differentials $(f(s_i, s_m) - f(s_i, s_k))$.

The probability that a woman i from group 1 marries outside her group can be expressed as an integral over the distribution of potential partners' socioeconomic

status:

$$P_1(\text{Intermarriage}|s_i) = \int\int [1 - \tilde{\Phi}(\lambda_1^w - (f(s_i, s_m) - f(s_i, s_k)))]dH_1^m(s_m)dH_2^m(s_k)$$

Similar conditions apply to man j from group 2, who make decisions from the opposite side of the marriage market:

$$P_2(\text{Intermarriage}|s_j) = \int\int [1 - \tilde{\Phi}(\lambda_2^m - (g(s_j, s_m) - g(s_j, s_k)))]dH_1^w(s_m)dH_2^w(s_k)$$

Since marriage market is a two-sided market, the probability of an intermarriage between woman i from group 1 and man j from group 2 is equal to:

$$P_{12}(\text{intermarriage}|s_i, s_j) = P_1(\text{intermarriage}|s_i) \times P_2(\text{intermarriage}|s_j)$$

This joint probability shows that intermarriages occurs only when both individuals independently determine that the match benefits exceed their respective intermarriage disutilities. The multiplication of probabilities reflects the independence of their decisions, as each individual evaluates their own utility function and preferences separately.

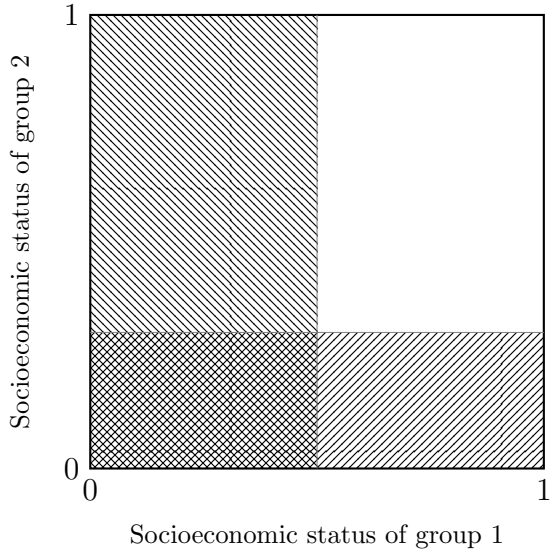
A key comparative static result is that an increase in either group's intermarriage disutility reduces the probability of intermarriage, even when the other group's disutility remains constant. Formally, for group 2's disutility:

$$\frac{\partial P_1}{\partial \lambda_1^w} = -\iint \tilde{\Phi}'(\lambda_1^w - (f(s_i, s_m) - f(s_i, s_k)))dH_1^m(s_m)dH_2^m(s_k) < 0$$

This result follows from the key property that $\tilde{\Phi}'(.)$ is strictly positive everywhere because $\tilde{\Phi}(.)$ is a cumulative distribution function and thus strictly increasing. Intuitively, since the distributions of both socioeconomic status and taste shocks remain unchanged, fewer potential matches can clear this higher intermarriage threshold, thereby reducing the probability of intermarriage.

These intermarriage thresholds not only affect marriage rates but also shape the characteristics of couples who do intermarry. When one group experiences higher average disutility from intermarriage, and taste shocks are identically distributed, this group will require a higher socioeconomic threshold to enter into intermarriage. Figure 2 illustrates the feasible matching set across all potential combinations of socioeconomic status, with the axes representing socioeconomic status of group 1 (horizontal) and group 2 (vertical), both normalized between 0 and 1. The diagonally hatched regions show combinations that Group 1 rejects, while the cross-hatched re-

Figure 2. Socioeconomic Status in an Intermarriage



Notes: The figure shows feasible intermarriage matches by socioeconomic status (normalized 0-1) for both groups. Diagonal-hatched areas show matches rejected by Group 1, cross-hatched areas by Group 2.

gions indicate combinations rejected by Group 2. Consequently, intermarriage occurs exclusively within the unshaded region in the upper right, where both groups find the match acceptable. Average education of individuals with lower intermarriage disutility is higher in this region. Two key patterns emerge in this region of feasible matches: first, individuals from the group with lower intermarriage disutility who choose to intermarry tend to have higher average education levels than their group members who marry within-group; second, members of the group with higher intermarriage disutility systematically marry partners of higher socioeconomic status compared to their own, leading to larger socioeconomic differentials than those observed for the group with lower intermarriage disutility.

If $f(.)$ is strictly monotonic in both arguments, when comparing two individuals with similar socioeconomic status—one who married outside their group and one who married within—the gap between their spouses' socioeconomic status (out-group versus in-group) correlates with their group's intermarriage disutility. Specifically, a larger socioeconomic status gap indicates relatively higher intermarriage disutility for that group.

This framework generates testable predictions about intermarriage. Specifically, we expect:

1. **Intermarriage rates**

   The probability of intermarriage for each group decreases with higher intermarriage disutility, as shown by $\partial P_i(\text{intermarriage}|s_i)/\partial\lambda^w < 0$ and $\partial P_j(\text{intermarriage}|s_j)/\partial\lambda^m < 0$. Therefore, an increase in either group's intermarriage disutility (λ^w or λ^m) reduces the overall intermarriage rate, with larger shocks producing proportionally larger effects, ceteris paribus.

   $$\partial P_{ij}(\text{intermarriage}|s_i, s_j)/\partial\lambda^w < 0 \text{ and } \partial P_{ij}(\text{intermarriage}|s_j, s_j)/\partial\lambda^m < 0$$

   Intuitively, this prediction captures how changes in social attitudes directly affect marriage market outcomes. When either group experiences an increase in their disutility from intermarriage—for instance, due to heightened social tensions or cultural prejudices—fewer individuals from that group will find intermarriage attractive enough to overcome the increased social cost. Moreover, since marriage requires mutual agreement, an increase in either group's resistance to intermarriage will reduce the overall rate of cross-group marriages, even if the other group's preferences remain unchanged.

2. **Sorting to intermarriage**

   If $f(.)$ is strictly monotonically increasing in both arguments, among groups with lower intermarriage disutility, individuals who choose to intermarry have higher average socioeconomic status compared to those who marry within their group.

   Intuitively, this prediction reflects the selective nature of who chooses to intermarry when their group faces lower barriers. When a group has relatively low resistance to intermarriage, those who actually pursue cross-group marriages tend to be individuals with higher socioeconomic status. This occurs because these individuals have access to a broader pool of potential partners and face fewer social constraints. Their higher status provides them with more opportunities and resources to overcome any remaining social barriers to intermarriage. Consequently, we should observe a positive selection to intermarriage, those who intermarry should have higher socioeconomic characteristics compared to their group members who marry within-group.

3. **Trade-offs in intermarriage**

   Intermarriage occurs only when its socioeconomic benefits compensate for the associated disutility. When taste shocks follow similar distributions and intermarriage disutility is positive ($\lambda^w > 0$), the expected socioeconomic value of intermarriage

must exceed that of intra-group marriages. If $f(.)$ is strictly monotonically increasing in both arguments, populations with higher intermarriage disutility exhibit larger socioeconomic differentials between inter- and intra-marriage matches in equilibrium.

This prediction captures the fundamental compensating differential mechanism in marriage markets. When a group has higher intermarriage disutility, those who intermarry must be compensated by other valuable characteristics in their partners. This compensation typically manifests as higher socioeconomic status—for instance, better education or higher income. The size of this compensating differential directly reflects the magnitude of the intermarriage disutility. Therefore, by comparing the socioeconomic "premium" that different groups require for intermarriage, we can infer their relative resistance to intermarriage. Groups that demand larger socioeconomic gains to accept an out-group spouse are revealing higher intermarriage disutility. In the context of Muslims in America, this allows us to compare the relative openness to intermarriage between Muslims and non-Muslims by examining the educational differentials in their intermarriage patterns.

Two key assumptions underpin these predictions. First, the distribution of taste shocks is assumed to be identical across groups. Second, the model abstracts from intermarriage driven by group-level imbalances in characteristics (in contrast to Chiappori et al. (2018)). This simplification is justified by the empirical context: educational differences between groups are minimal and thus unlikely to account for the observed intermarriage patterns. Furthermore, in the context of the 9/11 shock, it is reasonable to assume that the event affects only the disutility associated with intermarriage while leaving the distributions of socioeconomic characteristics and taste shocks unchanged. Additionally, given the relatively small size of the minority population compared to the majority, any educational imbalances within the Muslim community would have a negligible impact on the equilibrium of the majority's marriage market.

Sections 4 and 5 test the model's predictions. Section 4 examines the first prediction by analysing how 9/11, as a positive shock to intermarriage disutility, affected intermarriage probability. Section 5 examines second and third predictions by comparing sorting and trade-offs of Muslim with White Americans.

3 Data

In this study, I use American Community Survey (ACS) data (US Census Bureau, 2019) for the period 2008-2019, focusing on couples married between 1990 and 2015. I chose the ACS for its large sample size and inclusion of marriage timing information. The ACS draws a new sample of addresses each year rather than following the same households over time. While this cross-sectional structure means we do not observe marriages ended in divorce during the study period, additional analysis using Current Population Survey data in Appendix F shows that divorce rates remained stable around 9/11. This stability suggests that sample selection from excluding divorced couples is unlikely to systematically bias the results.

I restrict the sample to individuals of marriage age: men aged 20-54 and women aged 18-52. These age ranges are chosen to capture the vast majority of first marriages while accounting for gender-specific marriage patterns in the US. The two-year difference between men's and women's age ranges reflects the median spousal age gap observed in US marriages during this period.

Muslims constitute approximately 1.1% of the US population as of 2017 (Pew Research Center, 2017). A key feature distinguishing US Muslims from their European counterparts is their substantial racial and ethnic diversity, rather than being dominated by specific national-origin groups as is common in Europe (Gillum, 2018). First-generation immigrants comprise nearly 60% of US Muslim adults. Among American Muslims, Asian Americans (primarily from South Asian countries such as Pakistan, India, Bangladesh, and Afghanistan) and Arab Americans each represent approximately one-quarter of the population (Pew Research Center, 2017).

Large-scale surveys in the US typically do not collect religious affiliation data, making it challenging to identify Muslims. I address this by using country of origin as a proxy for Muslim identification. While imperfect, these proxies strongly correlate with religious affiliation (Pew Research Center, 2017). Two factors justify this approach. First, discrimination against Muslims extends beyond religious practitioners to those perceived as Muslim based on ethnic or cultural markers (Ruthven, 2006). For example, Baker et al. (2003) shows that similar proportions of Christian (12%) and Muslim (14%) Arab Americans reported post-9/11 challenges due to their ethnicity (Table 1). Second, while early waves of migration from Muslim-majority countries included significant Christian populations, immigration after 1965 has been

Table 1. Discrimination Experienced by Arab Americans due to their Race, Ethnicity, or Religion

	Christian	Muslim
Verbal insults or abuse	20%	24%
Threatening words or gestures	10%	14%
Physical attack	1%	3%
Vandalism or destruction of property	3%	5%
Loss of employment	2%	6%

Notes. Numbers show the percentage of Arab Americans who personally, or someone in their household, experienced discrimination/hate crime from 2001 to 2003. *Source.* Detroit Arab American Study (DAAS), 2003

predominantly Muslim[3]. This demographic shift means that most people originally from Muslim-majority countries in the marriage market during my study period are likely to be Muslim or perceived as Muslim by society.

I construct the Muslim identification proxy using individuals' responses to the ancestry question "What is this person's ancestry or ethnic origin?", focusing on their first reported ancestry. For foreign-born individuals with missing ancestry information, I use country of birth instead.[4] I classify someone as Muslim if they originate from a country where Muslims comprise more than 70% of the population. For countries where Muslim minorities predominantly speak a different language than the majority population, I use additional language information to refine the classification. Appendix C provides detailed documentation of this process.

While using country of origin as a proxy for Muslim identity offers the best available approach given data limitations, it is important to acknowledge potential misclassification concerns. In countries with Muslim majorities exceeding 70%, there are religious minorities whose members might be incorrectly classified as Muslim in my sample, and some Muslims from countries with smaller Muslim populations will be missed by this approach. If non-Muslims from Muslim-majority countries face similar social barriers as Muslims, this would lead to minimal bias in estimates. However, if they face different marriage market conditions, this could attenuate the estimated effects.

[3]Following the Immigration and Nationality Act of 1965, immigration from the Middle East and Asia increased significantly, with over half of the newcomers being Muslim (Smith, 2010).

[4]Although I limit the sample to US-born individuals, their spouses can be foreign-born, allowing me to use country of birth for spousal classification.

In response to 9/11, the US implemented several changes to immigration policies, including creating the Department of Homeland Security, dismantling the Immigration and Naturalization Service, and tightening rules and enforcement provisions for immigrants (Donovan, 2005). These policy shifts could have affected both the characteristics and population of first-generation immigrants in the US, making it difficult to separate immigration-related effects from changes in intermarriage preferences.

Second-generation immigrants, however, are less likely to be directly affected by changes in immigration policies. Therefore, I restrict my analysis to US-born individuals, which also ensures that marriage decisions were made within the US marriage market. While I do not place any immigration restrictions on spouses, I exclude marriages that occurred before the immigrant spouse's arrival to ensure couples met in the US. These excluded marriages represent only 0.5% of Muslim marriages in my sample, indicating that marriage migration is uncommon in the US context.

Table 2. Summary Statistics

	Non-Muslim		Muslim	
	Men	Women	Men	Women
Age	43.98	41.94	39.38	36.88
Age at Marriage	32.10	30.09	30.06	27.49
College Education (share)	0.62	0.68	0.83	0.85
Years of Schooling	15.23	15.60	17.08	17.13
English Proficiency (1-6)	3.06	3.07	3.31	3.40
Labor Force Participation	0.89	0.74	0.94	0.70
Unemployment Rate	0.04	0.04	0.03	0.05
Income (2008 US dollars)	67,300	39,300	103,300	57,300
Observations	2,939,431	3,010,037	4,351	5,161

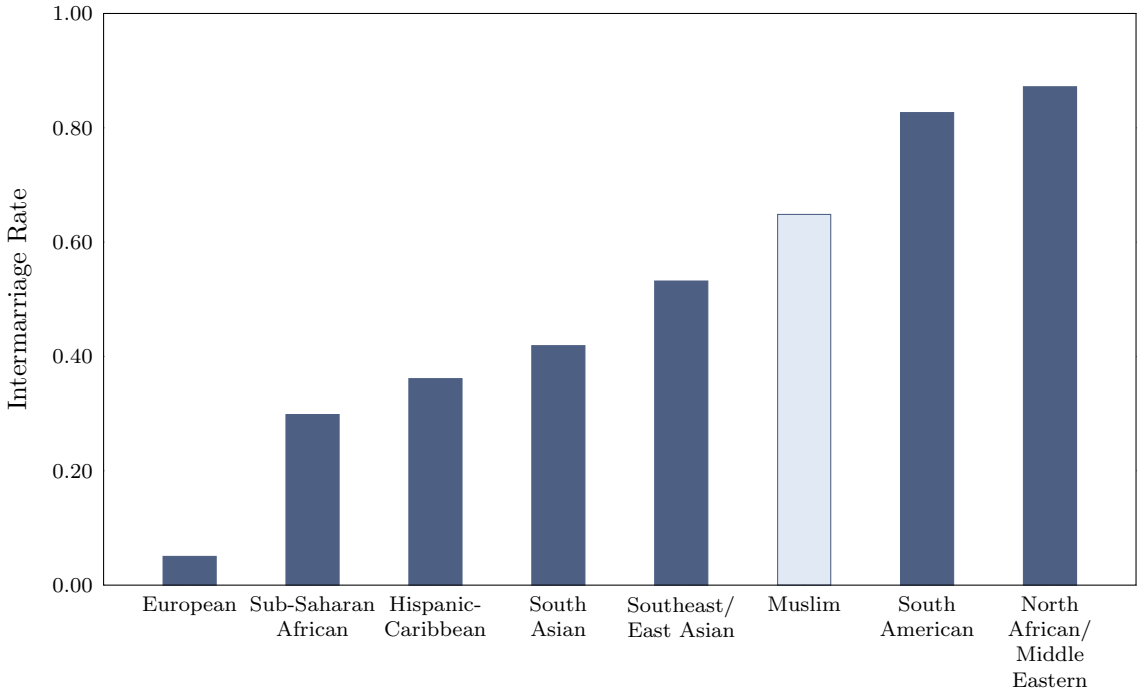
Source: American Community Survey 2008-2019. Sample includes US-born individuals (men aged 20-54 and women aged 18-52), married between 1990 and 2015. All numbers are weighted. Income values are standardized to 2008 US dollars using the Consumer Price Index (CPI).

Table 2 presents demographic and socioeconomic characteristics of individuals in the sample by religion and gender. To measure educational attainment, I create a years of schooling variable based on individuals' highest completed degree (details are provided in Appendix E). Muslims exhibit systematically higher human capital accumulation, with college completion rates exceeding 80% (compared to approximately 65% for non-Muslims) and approximately two additional years of schooling. Muslims in the sample also earn substantially higher incomes, particularly among men.

They tend to marry earlier and are generally younger, with Muslim women's average marriage age of 27.5 years being 2.5 years below their non-Muslim counterparts. In the labour market, Muslim men have both the highest labour force participation rate (94%) and lowest unemployment rate (3%), while Muslim women have the lowest participation rate (70%) and highest unemployment rate (5%) among all groups.

To compare Muslims with other ethnic minorities in the US, I classify individuals into eight distinct categories based on primary ancestry and country of birth: (1) White (Western and Eastern Europe, Nordic countries, the US, Canada, and Oceania); (2) Hispanic-Caribbean (Mexico, Central America, and the Caribbean); (3) South American; (4) North African and Middle Eastern; (5) Sub-Saharan African; (6) South Asian; (7) East and Southeast Asian; and (8) Muslims. Categories 4, 6, and 7 exclude individuals from Muslim-majority countries, who are classified into the Muslim category. Appendix D provides detailed documentation of this process.

Figure 3. Intermarriage Rates by Ethnic Group



I define intermarriage as marriage to a spouse from a different ethnic group. Figure 3 shows intermarriage rates across ethnic groups. Muslims in the sample have an intermarriage rate of approximately 65%, comparable to other religious groups in the US. Several factors contribute to this high rate of interreligious marriage. First, only 60% of Muslim Americans actively practice their religion (Pew Research Cen-

ter, 2017). Second, even among practicing Muslims, religious law permits men to marry Christian or Jewish women. Third, since conversion to Islam requires only a declaration of faith, religious barriers to intermarriage are relatively low.

Table 3. Marriage Market Statistics for Muslims

	Men		Women	
	Same Group	Inter-marriage	Same Group	Inter-marriage
Share of Marriages	0.31	0.69	0.39	0.61
Spouse is White	0.00	0.81	0.00	0.86
Age at Marriage	28.25	30.38	24.70	28.85
Age Gap (Spouse - Self)	-3.23	-1.51	4.02	2.29
College Education	0.82	0.82	0.80	0.87
Years of Schooling	16.96	16.93	16.69	17.23
Education Gap (Spouse - Self)$^{+}$	-0.35	-0.15	0.24	-0.57
Labor Force Participation	0.93	0.94	0.57	0.77
Unemployment Rate	0.03	0.02	0.08	0.04
Income	96,700	99,300	49,600	60,000
Income Gap (Spouse - Self)	-45,800	-41,300	41,600	28,000
Observations	1,140	2,877	1,700	3,100

Source: American Community Survey 2008-2019. Sample includes US-born Muslims (men aged 20-54 and women aged 18-52), married between 1990 and 2015. All numbers are weighted. Income values are standardized to 2008 US dollars using the Consumer Price Index (CPI). $^{+}$ Education gap measures spouse's years of schooling minus own years of schooling.

Table 3 examines marriage patterns of US-born Muslims, comparing characteristics of those who marry within their group to those who intermarry. Most of the intermarriages are with White Americans (81% for men and 86% for women). Muslims who intermarry tend to marry later and have smaller spousal age gaps. While men's educational attainment is similar across marriage types, women who intermarry have higher college completion rates and more years of schooling (17.2 versus 16.7 years). Both men and women who intermarry tend to have smaller education gaps with their spouses, marrying relatively lower educated spouses compared to those who marry within their group.

Labour market outcomes show similar patterns. Intermarried Muslim women have substantially higher labour force participation (77% versus 57%), lower unemployment (4% versus 8%), and higher income ($60,000 versus $49,600). Their income gaps with spouses are also smaller. Muslim men's labour market outcomes are simi-

lar across marriage types, though intermarried men have slightly higher income and smaller income gaps with their spouses.

These descriptive statistics do not account for group size or demographic characteristics across groups. In the next section, I control for these factors to identify how 9/11 affected Muslims' marriage market outcomes.

4 Extensive Margin: Probability of Intermarriage

The model predicts that an increase in intermarriage disutility reduces the probability of intermarriage. I test this prediction by examining how 9/11 affected Muslims' likelihood of intermarriage, using a differences-in-differences approach that compares US-born Muslims to other US-born minority groups before and after 9/11. The control groups include non-Muslim Hispanic-Caribbean, South American, North African and Middle Eastern, Sub-Saharan African, South Asian, and East and Southeast Asian individuals.

The identification strategy leverages 9/11 as an unexpected exogenous shock to social attitudes for several reasons. First, the attacks were completely unanticipated, preventing any anticipatory changes in marriage market behaviour. Second, the shock occurred at a precise point in time, providing a clear before-and-after comparison period. Third, while 9/11 had numerous societal impacts, its immediate effect on marriage markets would primarily operate through changes in social attitudes and preferences rather than through market fundamentals. This is because key marriage market characteristics—such as the education distribution, geographic location, and demographic composition of potential partners—are slow-moving variables that would not change discontinuously at the time of the shock.

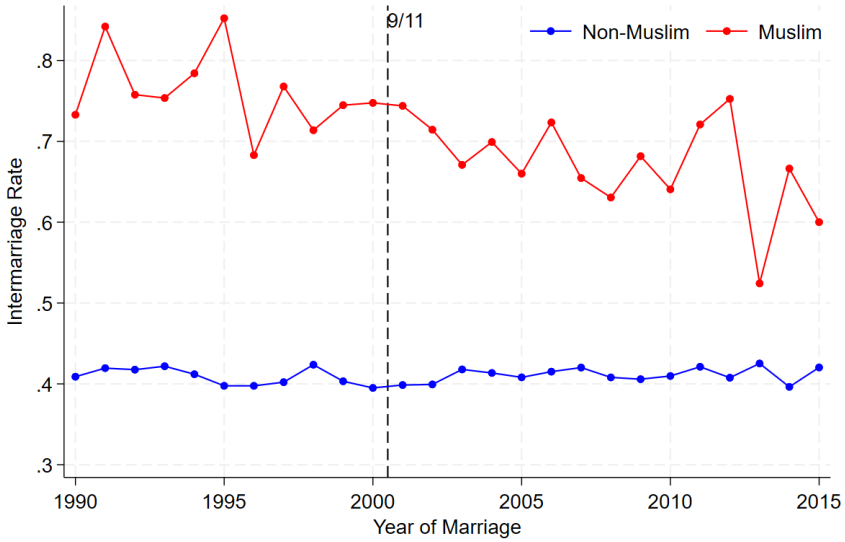
The sudden nature of 9/11 also helps isolate preference changes from institutional responses. While policy changes following 9/11 (such as immigration restrictions) could affect marriage markets, these institutional responses took time to implement and would primarily affect first-generation immigrants. Additionally, the fact that 9/11 represents an external shock to the American Muslims, rather than an event originating from within the community, strengthens its validity as an exogenous source of variation in intermarriage preferences.

Figure 4 plots intermarriage rates over time for Muslims and other minority groups to examine the parallel trends assumption. This assumption requires that, absent 9/11, the difference in intermarriage rates between Muslims and other minority groups

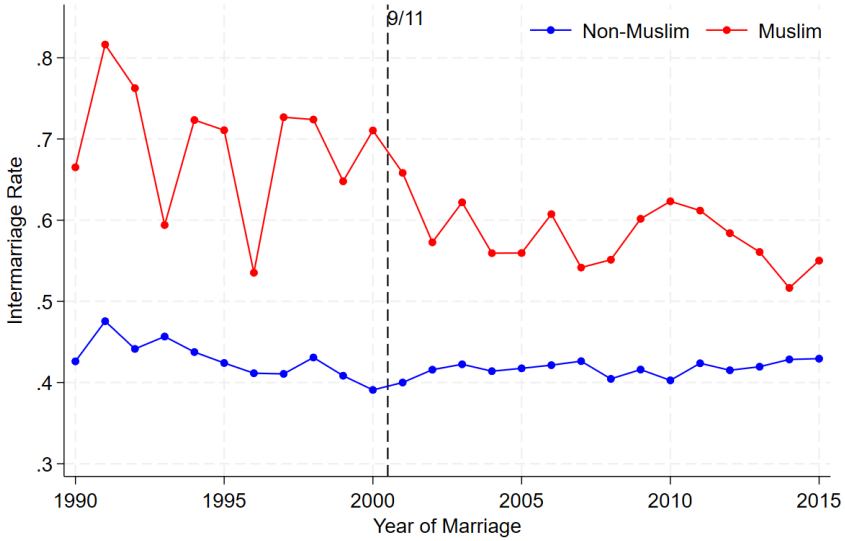
would have remained constant. Though the Muslim series is noisy due to small sample sizes, the pre-9/11 trends are similar between Muslims and control groups, supporting the validity of this assumption.

Figure 4. Intermarriage Rates of Muslims and Other Minorities, 1990-2015

(a) Male



(b) Female



Source: American Community Survey 2008-2019. Sample only includes US-born minorities (men aged 20-54 and women aged 18-52), married between 1990 and 2015.

To measure impact of 9/11, I estimate the following differences-in-differences spec-

ification:

$$Y_{ist} = \beta_1 \text{Muslim}_i + \beta_2 \text{Post9/11}_t + \beta_3 (\text{Muslim}_i \times \text{Post9/11}_t) + X_i'\gamma + \delta_t + \theta_s + \alpha_g + (\theta_s \times \alpha_g) + \varepsilon_{ist}$$

where Y_{ist} is a binary indicator for intermarriage for individual i in state s at time t. Muslim_i indicates whether the individual is Muslim, and Post/911_t is an indicator for the post-9/11 period. The coefficient of interest is β_3, which captures the differential change in intermarriage probability for Muslims relative to non-Muslims after 9/11. The vector X_i includes individual-level controls for educational attainment: years of schooling and a college education indicator. While years of schooling captures the linear effect of education on marriage patterns, I include college education separately to account for its distinct impact on match quality, following Chiappori et al. (2017) who document the additional premium of college education in marriage market outcomes.

The specification includes several fixed effects to account for different sources of unobserved heterogeneity:

1. Year of marriage fixed effects (δ_t): These control for aggregate time trends in intermarriage that affect all groups equally, such as changing social norms around mixed marriages, shifts in overall marriage rates, or macroeconomic conditions that influence marriage timing.
2. Birth cohort fixed effects (ν_b): These control for cohort-specific characteristics in marriage market.
3. Ethnic group fixed effects (α_g): These account for time-invariant differences across ethnic groups that affect their baseline propensity to intermarry, such as cultural attitudes toward out-group marriage, group size, or systematic differences in socioeconomic characteristics.
4. State fixed effects (θ_s): These capture time-invariant state characteristics that might affect intermarriage patterns, including demographic composition, historical attitudes toward minorities, or persistent differences in social and economic opportunities.
5. State and ethnic group interactions ($\theta_s \times \alpha_g$): These control for the possibility that different ethnic groups face systematically different marriage market conditions across states. For example, they account for variation in the relative size and geographic concentration of ethnic groups across states, which could affect the availability of potential partners and opportunities for intermarriage.
6. Year of survey fixed effects: These account for any systematic differences across

survey years that might affect how marriages are reported or recorded, ensuring our results are not driven by changes in data collection methods or response patterns.

Table 4 shows the effect of 9/11 on intermarriage rates. Column 1 presents results for the full sample, while Columns 2 and 3 show estimates separately for men and women. The results show that education is positively associated with intermarriage: each additional year of schooling increases the probability of intermarriage by 1.9 percentage points, with a particularly large effect (4 percentage points) for college education. These relationships hold consistently across gender, though the effect of education is slightly stronger for women. The key coefficient of interest, "Muslim × Post 9/11," shows that Muslims experienced an 8.1 percentage point decline in intermarriage rates after 9/11 relative to other minority groups. This effect is similar for both men and women, with declines of 7.5 and 8.8 percentage points, respectively. These estimates are highly statistically significant and robust to different specifications (Table A1).

Table 4. Impact of 9/11 on Intermarriage

Dependent variable: Intermarriage			
	All	Male	Female
Muslim	0.282***	0.313***	0.278***
	(0.052)	(0.061)	(0.076)
Post 9/11	0.159***	0.133***	0.180***
	(0.009)	(0.013)	(0.012)
Muslim × Post 9/11	-0.081***	-0.075***	-0.088***
	(0.013)	(0.019)	(0.018)
Years of Schooling	0.019***	0.017***	0.022***
	(0.000)	(0.001)	(0.001)
College Education	0.040***	0.043***	0.040***
	(0.003)	(0.004)	(0.004)
Observations	317,078	147,045	170,033
R^2	0.200	0.199	0.212

Notes: The sample is limited to ethnic minorities. All regressions control for cohort fixed effects, year of marriage fixed effects, state × group fixed effects, and year of survey fixed effects. Robust standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

To examine how the effect of 9/11 evolved over time, I estimate an event study

specification that allows for year-by-year effects:

$$Y_{ist} = \sum_{k \neq 2000} \beta_k (\text{Muslim}_i \times \text{Year}_k) + X_i'\gamma + \delta_t + \theta_s + \alpha_g + (\theta_s \times \alpha_g) + \varepsilon_{ist}$$

Using 2000 as the reference year, the coefficients β_k estimate the year-specific differential effects for Muslims relative to non-Muslims, normalized to this baseline period. The results, presented in Figure 5, show heterogeneous temporal responses across gender. For Muslim men, the effect appears more volatile, with some recovery in certain years but showing particularly large declines in later year. In contrast, Muslim women experienced a more immediate and persistent decline in intermarriage rates after 9/11. For both genders, the patterns before 9/11 fluctuate around zero, supporting the parallel trends assumption, though the estimates are noisy due to the limited sample size.

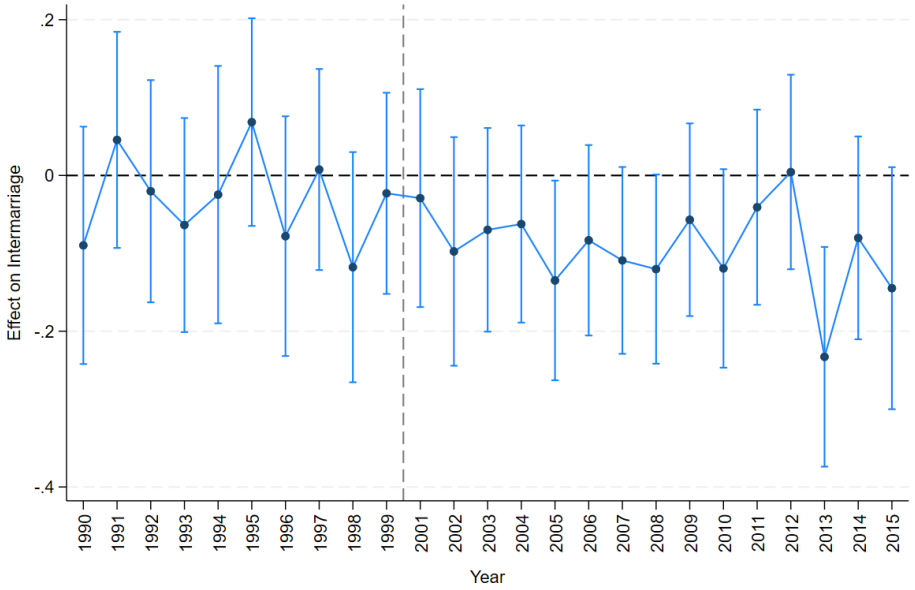
When Muslims intermarry, they match with partners from either other ethnic minorities or White Americans. While intermarriage between minorities indicates social mixing, only marriage to White Americans directly reflects integration into mainstream society. Table 5 shows that before 9/11, approximately 90% of Muslim intermarriages were with White Americans. After 9/11, Muslims' probability of marrying White Americans fell by 10.7 percentage points, with similar declines for both men (-11.2) and women (-10.4). This decrease exceeds the overall 8.1 percentage point decline in intermarriage rates, suggesting a shift toward marriages with other minority groups.

Instead of intermarriage, US-born Muslims can marry other US-born Muslims, first-generation immigrant Muslims, or remain single. Immigrant spouses may be existing US residents or migrate specifically for marriage ("marriage migration" following Farahzadi (2024)). Table 6 analyses both types of immigrant marriages. After 9/11, Muslim men were 4.4 percentage points more likely than other minority men to marry immigrant spouses who were already US residents, and 2.2 percentage points more likely to engage in marriage migration. Muslim women showed no significant changes in either pattern. Education correlates negatively with immigrant marriage, particularly for women, consistent with Farahzadi (2024)'s finding that less educated individuals are more likely to import spouses to high-income countries.

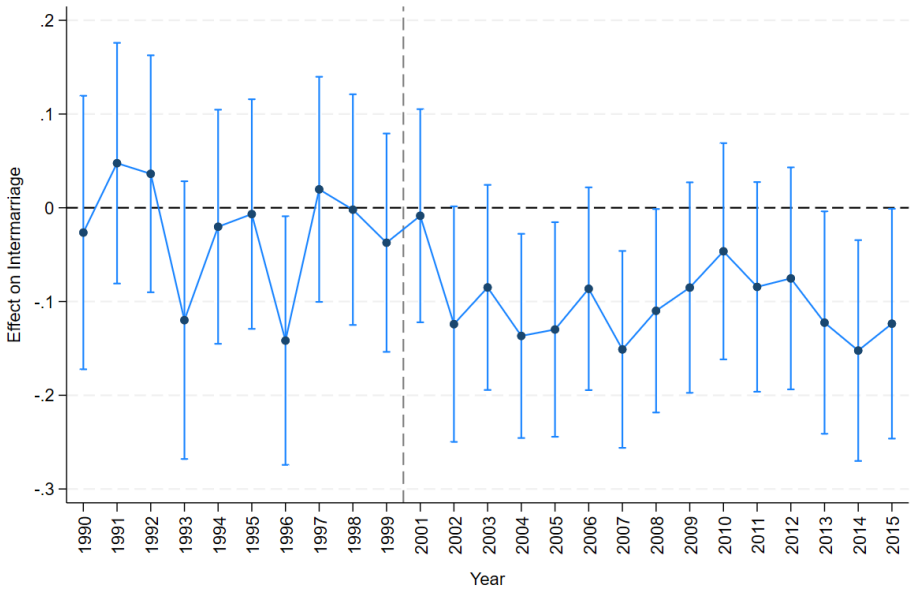
The decline in intermarriage and shift toward immigrant spouses raises the question of whether Muslims also changed their overall propensity to marry. Since the American Community Survey (ACS) begins after 9/11, I use Current Population

Figure 5. Dynamic Impact of 9/11 on Intermarriage

(a) Male



(b) Female



Note: Year 2000 is the baseline. The sample is limited to ethnic minorities. All regressions control for cohort fixed effects, year of marriage fixed effects, state × group fixed effects, and year of survey fixed effects. Error bars show the 95% confidence intervals

Table 5. Impact of 9/11 on Muslim-White Intermarriage

Dependent variable: Spouse is White			
	All	Male	Female
Muslim	0.283***	0.296**	0.285***
	(0.070)	(0.117)	(0.080)
Post 9/11	0.091***	0.068***	0.112***
	(0.008)	(0.012)	(0.012)
Muslim × Post 9/11	-0.107***	-0.112***	-0.104***
	(0.013)	(0.020)	(0.018)
Years of Schooling	0.017***	0.014***	0.019***
	(0.000)	(0.001)	(0.001)
College Education	0.026***	0.027***	0.027***
	(0.003)	(0.004)	(0.004)
Observations	357,640	165,160	192,480
R^2	0.143	0.143	0.154

Notes: The sample is limited to ethnic minorities. All regressions control for state × group fixed effects, year of marriage fixed effects, cohort fixed effects, and year of survey fixed effects. Robust standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Survey (CPS) data to analyse changes in marriage formation and dissolution. Appendix F presents a detailed analysis comparing Muslims with other minority groups before and after 9/11. The results show no significant differences in separation rates post-9/11. Moreover, Muslim women were 3.5 percentage points less likely to remain single after 9/11 compared to other minority women. These patterns suggest that Muslims responded to 9/11 by changing whom they married rather than whether they married.

The main analysis of this paper focuses on US-born Muslims to eliminate the impact of changing immigration policies and language/cultural barriers in the marriage market. To benchmark these findings, I compare the results with those for first-generation immigrants. I limit the sample to immigrants who arrived in the US before age 18, as their marriage decisions were likely made within the US marriage market rather than in their countries of origin. Table A2 presents results across different specifications. The findings reveal that immigrant Muslim men experienced a smaller decline in intermarriage rates (approximately 6 percentage points) compared to their US-born counterparts. Notably, immigrant Muslim women showed no significant changes in their intermarriage patterns. These results should be inter-

Table 6. Impact of 9/11 on Marriage with Immigrants

	Immigrant Spouse		Marriage Migration	
	Male	Female	Male	Female
Muslim	-0.060	0.027	-0.051	0.018
	(0.080)	(0.080)	(0.064)	(0.061)
Post 9/11	0.045***	-0.057***	0.072***	0.024***
	(0.011)	(0.010)	(0.008)	(0.008)
Muslim × Post 9/11	0.044***	0.027	0.022**	0.015
	(0.015)	(0.017)	(0.010)	(0.012)
Years of Schooling	-0.005***	-0.011***	0.000	-0.003***
	(0.001)	(0.001)	(0.000)	(0.000)
College Education	0.005	-0.016***	0.007**	-0.008***
	(0.004)	(0.004)	(0.003)	(0.003)
Observations	165,160	192,480	233,127	273,676
R^2	0.031	0.046	0.026	0.028

Notes: The sample is limited to first generation ethnic minorities who migrated before age 18. All regressions control for state × group fixed effects, year of marriage fixed effects, cohort fixed effects, and year of survey fixed effects. Robust standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

preted with caution, as post-9/11 immigration policies may have differentially affected Muslim and non-Muslim groups, potentially altering the composition of immigrant populations and confounding the estimated effects on marriage outcomes.

To summarize the findings of extensive margin, US-born Muslims experienced a significant decline in intermarriage rates, primarily driven by reduced marriages with the White majority population. The shift away from intermarriage was not compensated by higher rates of separation or singlehood, but rather by increased in-group marriages. The gender dynamics in these patterns are particularly noteworthy: while both Muslim men and women experienced comparable declines in marriages with White partners, only men exhibited a compensating increase in marriages to immigrant spouses and participation in marriage migration.

While 9/11 provides a plausibly exogenous shock to intermarriage preferences, several potential threats to identification warrant careful consideration. First, selective migration could bias our estimates if Muslims or non-Muslims responded to 9/11 by relocating to areas with different marriage market conditions. While our focus on US-born individuals mitigates concerns about international migration, internal migration remains a potential confounder. However, considering low rate of internal

migration in the US documented by Molloy et al. (2011), it is unlikely to derive the result.

Second, changes in local economic conditions that differentially affect Muslims could confound our results if they influence marriage market outcomes. For instance, if 9/11 led to reduced economic opportunities for Muslims in certain areas, this might affect their attractiveness as potential partners independent of changes in social attitudes. I address this concern by controlling for state-by-ethnic group fixed effects.

Third, changes in reporting behaviour could bias our estimates if 9/11 affected how people report their marriages or ancestries in survey data. However, this seems unlikely to drive our results given that we observe similar patterns across different data sources (ACS and CPS) and across different measures of marriage outcomes.

5 Intensive Margin of Intermarriage

The previous section demonstrated that 9/11 reduced the probability of Muslim-White intermarriage, this extensive margin effect tells only part of the story of how marriage market outcomes changed. Even as fewer Muslims and White Americans intermarried, those who did choose to form cross-group marriages might have systematically different characteristics from those who did so before 9/11. This intensive margin analysis examines these compositional changes by focusing on two key aspects: first, how the selection of individuals into intermarriage changed, and second, how the trade-offs people made between group identity and spousal characteristics evolved after 9/11. Understanding these intensive margin effects is crucial because they help identify whether the barriers to intermarriage rose more substantially for a group than the other one. In addition, by examining how compensating differentials in marriage matching changed, we can better understand whether 9/11 affected Muslims' and White Americans' preferences for intermarriage differently or proportionally.

This section focuses specifically on marriages between Muslims and White Americans for several key reasons. First, marriage with the majority White population represents the most direct measure of integration into mainstream American society, as opposed to intermarriage between different minority groups which may reflect different social dynamics. Second, the extensive margin analysis showed that 9/11 significantly affected intermarriage rates between Muslims and White Americans, but not between Muslims and other minority groups.

I use education as a key socioeconomic characteristic to compare individuals who

marry within their group versus those who marry outside it. Education serves as a relatively stable proxy for economic potential, as it is largely predetermined by the time of marriage. This contrasts with income, which has been shown to be endogenous to intermarriage (Meng and Gregory, 2005). While educational attainment could, in theory, be influenced by spousal characteristics, this concern is alleviated by two factors: first, educational outcomes are primarily shaped by individual and family background characteristics; second, less than 10% of the sample marries before the age of 22, by which time most formal education is completed. I measure educational attainment using two metrics: years of schooling and a binary indicator for college education, where the indicator equals one if an individual has attained a college degree or higher, and zero otherwise. Since men and women may value educational attainment of their spouses differently in the marriage market, I allow for gender-specific responses by estimating separate equations for men and women.

5.1 Sorting to Intermarriage

Individuals who intermarry can systematically differ from those who marry within their own group. The model predicts that when one group has higher intermarriage disutility, their potential partners from other groups must compensate with higher socioeconomic status for marriages to occur. Hence, when one group has relatively low intermarriage disutility, its members who choose to intermarry tend to have higher socioeconomic status compared to those who marry within the group.

To analyse education sorting patterns in intermarriage among Muslims and White Americans and impact of 9/11, I estimate a specification that compares the educational attainment of individuals who marry within versus outside their group, before and after 9/11:

$$\mathrm{X}_{ist} = \beta_1 \mathrm{Intermarriage}_i + \beta_2 \mathrm{Post9/11}_t + \beta_3 \mathrm{Intermarriage}_i \times \mathrm{Post9/11}_t + \delta_t + \nu_b + \theta_s + \varepsilon_{ist}$$

where X_{ist} is either education level for individual i in state s at time t. The baseline coefficient β_1 on intermarriage reflects the pre-9/11 education differential between those who intermarry versus marry within-group. This coefficient captures how the relative magnitude of group-specific intermarriage disutility (λ) affects selection into intermarriage. A positive coefficient suggests lower intermarriage disutility, as predicted by the model when individuals with higher education are more likely to overcome group boundaries. The coefficient of interaction term, β_3, capture changes in the sorting parameters after the shock. If 9/11 increased intermarriage disutility,

we would expect significant effects in sorting patterns. The specification includes time fixed effects (δ_t), birth year fixed effects (ν_b), and state fixed effects (θ_s) to control for various sources of unobserved heterogeneity.

Table 7. Impact of 9/11 on Education Sorting in Intermarriage - Muslims

	Dependant variable: Own Education Level			
	Years of Schooling		College Education	
	Male	Female	Male	Female
Intermarriage	0.785***	1.158***	0.118***	0.136***
	(0.278)	(0.229)	(0.038)	(0.031)
Post 9/11	1.182*	2.948***	0.015	0.288***
	(0.618)	(0.503)	(0.081)	(0.064)
Intermarriage × Post 9/11	-1.149***	-0.923***	-0.133***	-0.097***
	(0.316)	(0.257)	(0.042)	(0.035)
Observations	3,491	4,389	3,491	4,389
R^2	0.107	0.163	0.104	0.117

Notes: The sample is limited to US-born Muslims. All regressions control for state fixed effects, year of marriage fixed effects, year of survey fixed effects, and cohort fixed effects. Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 7 presents the coefficients for Muslims. Prior to 9/11, Muslims who intermarried had significantly higher educational attainment than those who married within their group. Muslim men and women who intermarried had respectively 0.79 and 1.16 more years of schooling, and were 12 and 14 percentage points more likely to hold college degrees. However, this educational gradient in intermarriage significantly decreased after 9/11, as shown by the negative interaction coefficients, suggesting that the heightened intermarriage disutility decreased probability of intermarriage of high educated Muslims. These findings remain robust across different specifications (Table A3 and Table A4). In sum, results suggest a pattern of negative selection into intermarriage after 9/11, with lower-educated Muslims becoming more likely to marry outside their group.

Table 8 presents the results for White Americans. Prior to 9/11, White Americans who intermarried showed significantly higher educational attainment than those who married within their group, with men displaying a larger gap than women (1.27 vs 0.73 years of schooling). After 9/11, this educational gradient decreased modestly for both genders, suggesting that while 9/11 affected sorting patterns in White-Muslim marriages, the impact was less pronounced than the changes observed in the Muslim

Table 8. Impact of 9/11 on Education Sorting in Intermarriage - White Americans

	Dependant variable: Own Education Level			
	Years of Schooling		College Education	
	Male	Female	Male	Female
Intermarriage	1.269***	0.730***	0.146***	0.095***
	(0.091)	(0.072)	(0.012)	(0.011)
Post 9/11	-0.400***	0.395***	-0.052***	0.039***
	(0.024)	(0.023)	(0.004)	(0.004)
Intermarriage × Post 9/11	-0.204*	-0.243***	-0.017	-0.045***
	(0.111)	(0.091)	(0.015)	(0.013)
Observations	2,131,902	2,187,049	2,131,902	2,187,049
R^2	0.036	0.052	0.030	0.042

Notes: The sample is limited to US-born Whites. All regressions control for state fixed effects, year of marriage fixed effects, year of survey fixed effects, and cohort fixed effects. Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

population. These findings remain robust across different specifications (Table A5 and Table A6).

Figure A1 and Figure A2 show the dynamic effects respectively for Muslim and White Americans. While pre-9/11 estimates fluctuate around zero, there is a gradual decline in educational attainment of those who intermarry after 9/11, with the effect becoming more pronounced in later years. The confidence intervals are wide due to small sample sizes, however, the patterns suggest that 9/11 had persistent effects on educational sorting for both genders.

The model assumes uniform intermarriage disutility across education levels, but this assumption may not fully capture reality. The observed changes in educational sorting could partly reflect heterogeneity in intermarriage disutility by education levels. More educated individuals might have lower tendency to marry within their group due to greater exposure to diverse groups. This heterogeneity in responses could contribute to the observed educational sorting, alongside the mechanisms predicted by the model.

5.2 Trade-offs in Intermarriage

This section examines the trade-offs between different characteristics in marriage matching decisions for Muslims and non-Muslims. The model predicts that groups with higher intermarriage disutility will exhibit larger socioeconomic compensating differentials between inter- and intra-marriage matches in equilibrium. Following

this logic, if 9/11 increased intermarriage disutility more substantially for one group than the other, we would expect to observe larger compensating differentials for that group. However, if 9/11 increased both groups' disutility proportionally, the relative trade-offs in spousal characteristics would remain unchanged.

$$Y^w_{ist} = \beta^y_1 \text{Intermarriage}_i + \beta^y_2 \text{Post9/11}_t + \beta^y_3 \text{Intermarriage}_i \times \text{Post9/11}_t + (X^h_{ist})'\gamma + \delta_t + \nu_b + \theta_s + \varepsilon_{ist}$$

$$Y^h_{ist} = \beta^x_1 \text{Intermarriage}_i + \beta^x_2 \text{Post9/11}_t + \beta^x_3 \text{Intermarriage}_i \times \text{Post9/11}_t + (X^w_{ist})'\gamma + \delta_t + \nu_b + \theta_s + \nu_{ist}$$

The dependent variables Y^w_{ist} and Y^h_{ist} represent level of education for wives and husbands respectively, in couple i, state s, at time t. The coefficients β^y_2 and β^x_2 measure the intermarriage differential by comparing spouse characteristics between individuals who marry within versus outside their religious group, specifically comparing Muslims to other ethnic minorities. the intermarriage coefficients (β^y_1 and β^x_1) measure the compensating differentials in spouse quality required for intermarriage. These coefficients directly reflect the relative magnitude of intermarriage disutility between groups. Larger coefficients indicate higher intermarriage disutility, as they imply greater spousal quality is required to overcome group boundaries. The interaction coefficients (β^y_3 and β^x_3) capture changes in trade-off parameters after the shock. If 9/11 increased intermarriage disutility proportionally for both groups, I would expect minimal changes in the trade-off coefficients. To account for potential confounders, the model controls for both spouses' characteristics through vectors X^h_i and X^w_i, and includes time fixed effects (δ_t), birth year fixed effects (ν_b), and state fixed effects (θ_s) to control for various sources of unobserved heterogeneity.

Table 9 presents regression results for Muslims. The substantial coefficients for both years of schooling and college education provide robust evidence of educational assortative matching, aligning with theoretical predictions and corroborating findings from prior studies (Becker, 1973; Schwartz and Mare, 2005; Greenwood et al., 2014; Eika et al., 2019).

Prior to 9/11, Muslim men in intermarriages had spouses with 0.46 more years of education compared to those in intra-marriages, while Muslim women showed no significant educational differences between inter- and intra-marriages. After 9/11, the educational advantages in intermarriage declined modestly, particularly for Muslim women (coefficient of -0.48), though this effect was only marginally significant. The dynamic analysis supports these baseline results (Figure A3).

Table 9. Impact of 9/11 on Trade-offs in Intermarriage - Muslims

	Dependant variable: Spouse's Education Level			
	Years of Schooling		College Education	
	Male	Female	Male	Female
Intermarriage	0.462**	-0.203	0.045	-0.005
	(0.225)	(0.212)	(0.033)	(0.030)
Post 9/11	0.713	2.809***	-0.019	0.148*
	(1.305)	(0.610)	(0.218)	(0.081)
Intermarriage × Post 9/11	-0.301	-0.477*	-0.002	-0.026
	(0.258)	(0.244)	(0.038)	(0.034)
Years of Schooling	0.473***	0.564***	0.030***	0.041***
	(0.029)	(0.032)	(0.004)	(0.004)
College Education	0.325	-0.055	0.205***	0.180***
	(0.202)	(0.214)	(0.034)	(0.034)
Age of Marriage	0.025	-0.075***	0.002	-0.003
	(0.050)	(0.020)	(0.008)	(0.002)
Observations	3491	4389	3491	4389
R^2	0.336	0.337	0.239	0.248

Notes: The sample is limited to US-born Muslims. All regressions control for state fixed effects, year of marriage fixed effects, year of survey fixed effects, and cohort fixed effects. Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 10 analyses educational trade-offs in intermarriages for White partners. Prior to 9/11, White Americans who intermarried showed stronger educational advantages in their matches than Muslims, marrying significantly higher educated Muslims. In intermarriages, White men and women's spouses were respectively 5.1 and 10.1 percentage points more likely to hold college degrees compared to spouses in intra-group marriages. These pre-9/11 differences were not only larger in magnitude but also more statistically significant than those observed in the Muslim population. However, after 9/11, the changes in educational trade-offs were statistically and economically insignificant for White Americans.

In summary, Muslims engage in approximately assortative matching in intermarriage, while non-Muslims who marry Muslims tend to match with more educated partners, suggesting they require an educational premium to compensate for their higher intermarriage disutility. This pattern aligns with the sorting results, which show that higher-educated Muslims are more likely to enter intermarriages. While 9/11 significantly affected both intermarriage rates and educational sorting patterns, its limited impact on educational trade-offs suggests that it may have increased inter-

Table 10. Impact of 9/11 on Trade-offs in Intermarriage - White Americans

	Dependant variable: Spouse's Education Level			
	Years of Schooling		College Education	
	Male	Female	Male	Female
Intermarriage	0.529***	0.940***	0.051***	0.101***
	(0.076)	(0.075)	(0.011)	(0.010)
Post 9/11	0.151*	-0.489***	0.045***	-0.058***
	(0.085)	(0.123)	(0.017)	(0.019)
Intermarriage × Post 9/11	-0.094	-0.071	-0.024*	-0.003
	(0.096)	(0.093)	(0.013)	(0.013)
Years of Schooling	0.433***	0.514***	0.037***	0.050***
	(0.001)	(0.001)	(0.000)	(0.000)
College Education	0.344***	0.108***	0.170***	0.150***
	(0.008)	(0.008)	(0.001)	(0.001)
Age of Marriage	0.003	0.007	-0.001	0.001
	(0.003)	(0.005)	(0.001)	(0.001)
Observations	2,131,902	2,187,049	2,131,902	2,187,049
R^2	0.285	0.274	0.193	0.198

Notes: The sample is limited to US-born Whites. All regressions control for state fixed effects, year of marriage fixed effects, year of survey fixed effects, and cohort fixed effects. Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

marriage disutility proportionally across both groups, thereby preserving the relative compensating differentials in equilibrium matches.

6 Conclusion

I examine how an exogenous shock to social attitudes—the 9/11 terrorist attacks—affected preferences for religious intermarriage between Muslims and non-Muslims in the United States. By developing a theoretical model of intermarriage that demonstrates how individuals trade off potential spouses' attributes against group-identity preferences, I provide a framework for understanding both who chooses to intermarry and the characteristics of resulting matches.

In my extensive margin analysis, I find substantial changes in intermarriage patterns following 9/11. Muslims experienced an 8.1 percentage point decline in intermarriage rates, with similar effects for both men (-7.5 percentage points) and women (-8.8 percentage points). I show that this decline primarily reflected a shift toward intra-religious marriage rather than increased rates of remaining single, suggesting

that Muslims adapted to changed social conditions by adjusting whom they married rather than whether they married. I find the effect was particularly pronounced for marriages with White Americans, indicating reduced integration with the majority population.

My analysis of the intensive margin reveals how the characteristics of intermarriages changed after 9/11. I find evidence of negative selection into intermarriage: more educated Muslims became less likely to marry outside their religious group. White Americans who intermarry tend to match with more educated Muslim spouses, suggesting they face higher intermarriage disutility requiring compensation. In contrast, Muslims exhibit approximately assortative matching patterns regardless of spouse type. I find these patterns remained stable after 9/11, indicating that the shock affected both groups' preferences proportionally rather than altering their relative trade-offs.

I find important gender differences in how Muslims adapted to increased social barriers. While both Muslim men and women experienced similar declines in intermarriage with White partners, I show that only men showed an increased tendency toward immigrant marriages and marriage migration. This asymmetric response suggests that men and women face different constraints or adopt different strategies when navigating changing marriage market conditions.

My findings demonstrate that increased discrimination and social barriers affect not only economic outcomes but also fundamental social choices such as marriage. The persistent decline in Muslim intermarriage rates suggests a potential slowdown in the social integration of Muslims in American society. This effect on marriage markets represents an important but previously undocumented channel through which discrimination can impact long-term social cohesion.

My results have important implications for policies aimed at promoting social integration. Policymakers should consider marriage market outcomes when assessing the broader impacts of discrimination, as these patterns can have long-term consequences for social cohesion. The efforts to promote social integration should consider not only formal institutional barriers but also informal social barriers that affect fundamental personal choices.

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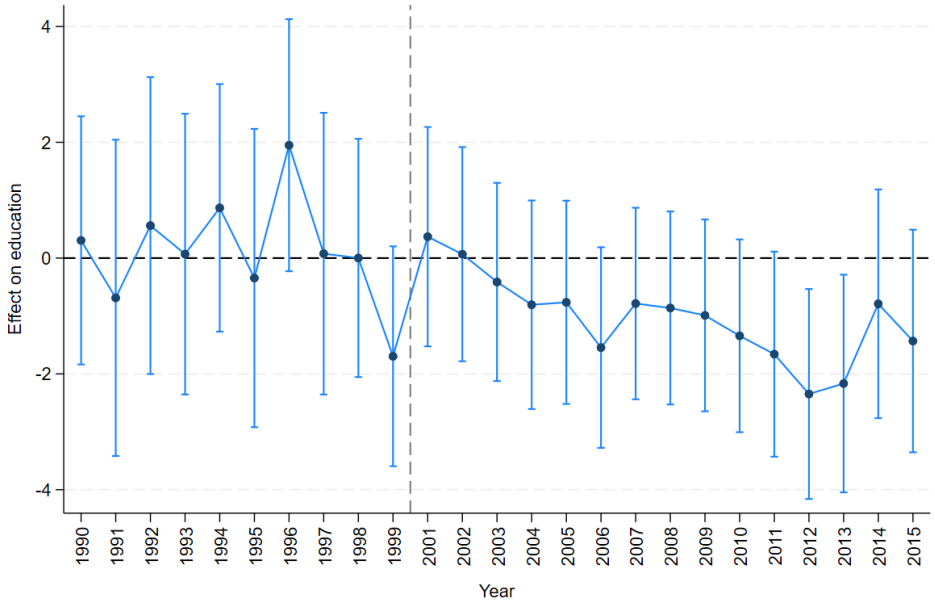
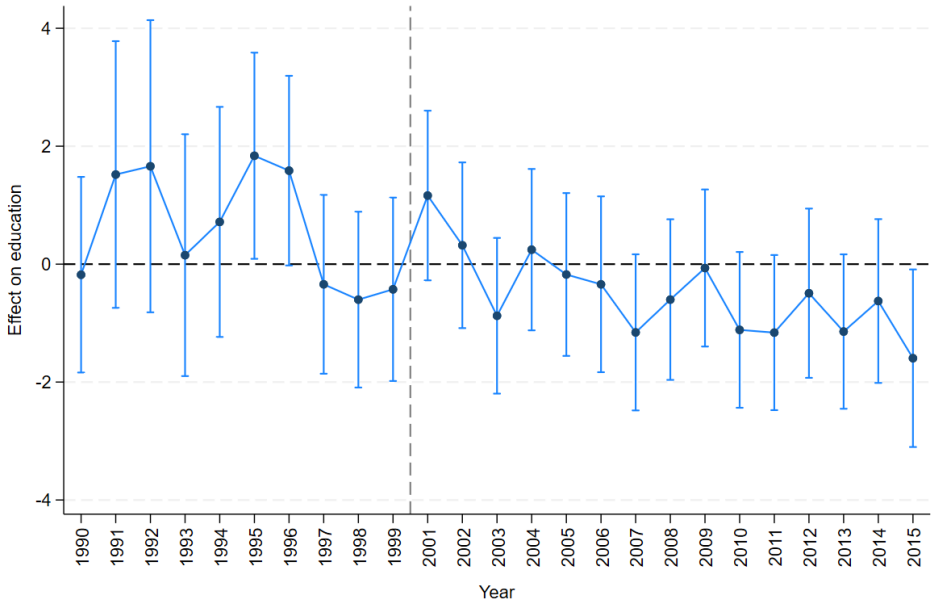
A Appendix Tables and Figures

Figure A1. Dynamic Effect of 9/11 on Sorting by Education - Muslims

(a) Male



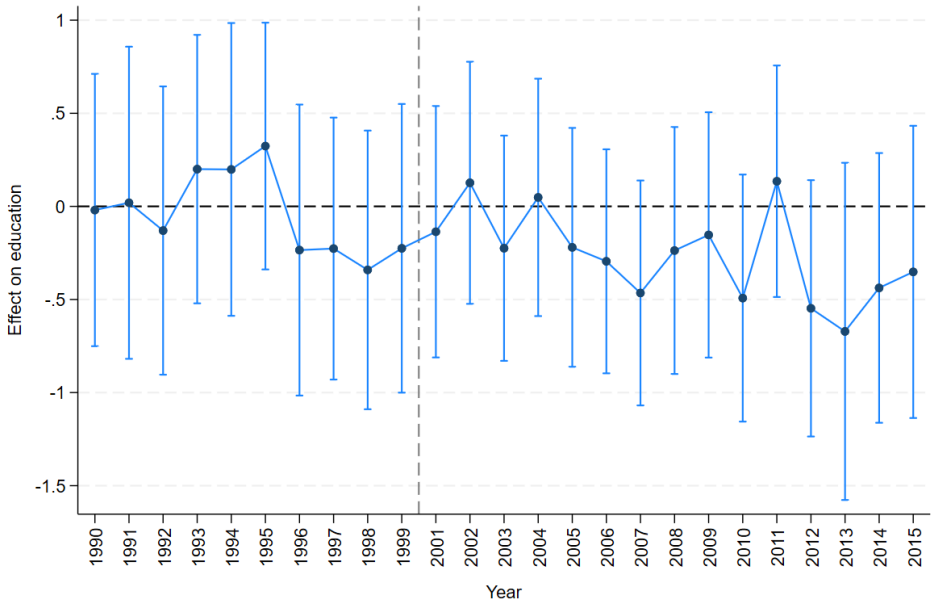
(b) Female



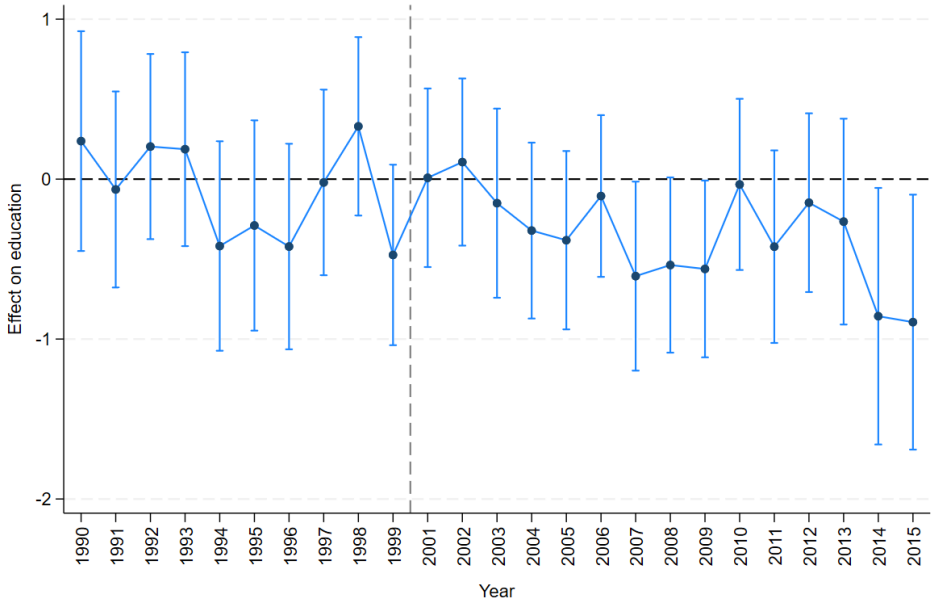
Note: Year 2000 is the baseline. The sample is limited to US-born Muslims.

Figure A2. Dynamic Effect of 9/11 on Sorting by Education - White Americans

(a) Male



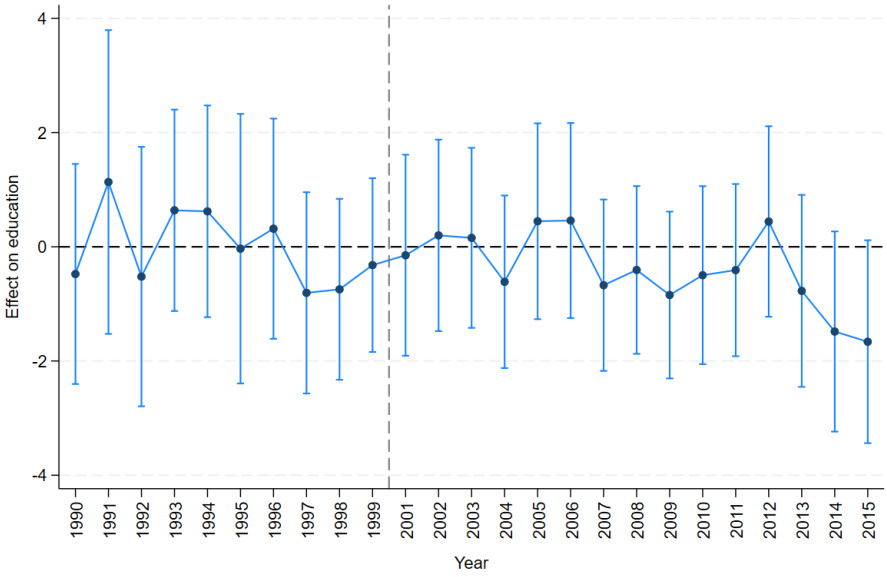
(b) Female



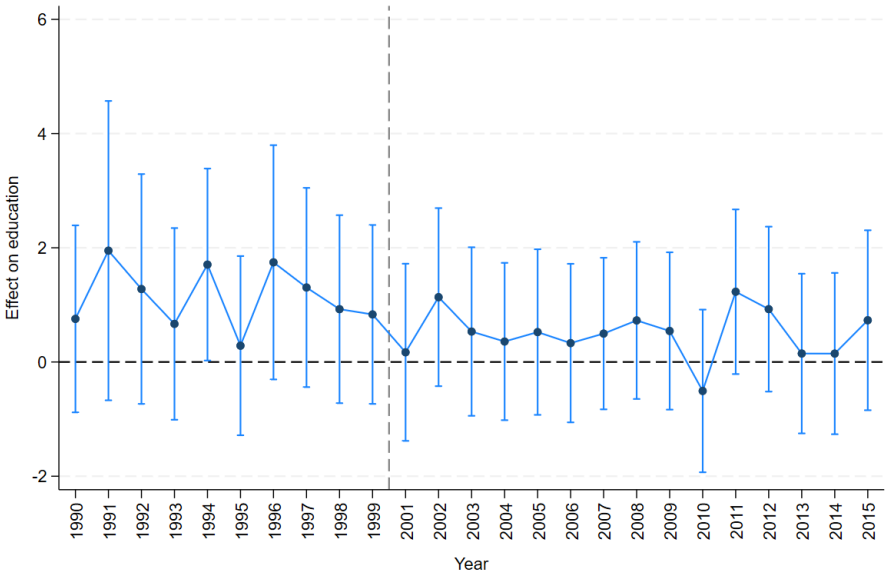
Note: Year 2000 is the baseline. The sample is limited to US-born Whites.

Figure A3. Dynamic Effect of 9/11 on Education Trade-off

(a) Male



(b) Female



Note: Year 2000 is the baseline. The sample is limited to US-born Muslims. All regressions control for cohort fixed effects, year of marriage fixed effects, state × group fixed effects, and year of survey fixed effects. Error bars show the 95% confidence intervals

Table A1. Impact of 9/11 on Intermarriage (for US-born Minorities) - Robustness Checks

	Male				Female			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Muslim	0.318***	-0.002	0.212***	0.313***	0.260***	-0.016	0.174***	0.278***
	(0.016)	(0.016)	(0.017)	(0.061)	(0.015)	(0.015)	(0.015)	(0.076)
Post 9/11	0.148***	0.126***	0.138***	0.133***	0.187***	0.169***	0.183***	0.180***
	(0.014)	(0.014)	(0.014)	(0.013)	(0.013)	(0.013)	(0.013)	(0.012)
Muslim × Post 9/11	-0.091***	-0.076***	-0.065***	-0.075***	-0.099***	-0.086***	-0.081***	-0.088***
	(0.019)	(0.019)	(0.020)	(0.019)	(0.018)	(0.018)	(0.018)	(0.018)
Years of Schooling	0.021***	0.016***	0.018***	0.017***	0.024***	0.021***	0.022***	0.022***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
College Education	0.038***	0.044***	0.046***	0.043***	0.040***	0.041***	0.041***	0.040***
	(0.005)	(0.005)	(0.005)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Group FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Group share by state	No	Yes	No	No	No	Yes	No	No
State FE	No	No	Yes	Yes	No	No	Yes	Yes
State × Group FE	No	No	No	Yes	No	No	No	Yes
Year of Marriage FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year of Survey FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cohort FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	147,045	147,045	147,045	147,045	170,033	170,033	170,033	170,033
R^2	0.090	0.171	0.169	0.199	0.130	0.190	0.189	0.212

Notes: The sample is limited to US-born ethnic minorities. Robust standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A2. Impact of 9/11 on Intermarriage (for First-generation Minorities) - Robustness Checks

	Male				Female			
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Muslim	0.234***	0.123***	0.220***	0.207***	0.083***	0.020**	0.076***	0.108**
	(0.009)	(0.009)	(0.009)	(0.049)	(0.009)	(0.009)	(0.009)	(0.046)
Post 9/11	0.039***	0.027***	0.030***	0.025***	0.143***	0.133***	0.135***	0.137***
	(0.008)	(0.008)	(0.008)	(0.008)	(0.009)	(0.009)	(0.009)	(0.009)
Muslim × Post 9/11	-0.062***	-0.056***	-0.060***	-0.053***	0.016	0.020*	0.017	0.022**
	(0.010)	(0.010)	(0.010)	(0.010)	(0.011)	(0.011)	(0.010)	(0.010)
Years of Schooling	0.009***	0.008***	0.008***	0.008***	0.013***	0.012***	0.012***	0.012***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
College Education	0.065***	0.067***	0.069***	0.062***	0.071***	0.071***	0.075***	0.072***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Group FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Group share by state	No	Yes	No	No	No	Yes	No	No
State FE	No	No	Yes	Yes	No	No	Yes	Yes
State × Group FE	No	No	No	Yes	No	No	No	Yes
Year of Marriage FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year of Survey FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cohort FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	258,279	258,279	258,279	258,279	271,427	271,427	271,427	271,427
R^2	0.091	0.106	0.111	0.137	0.136	0.145	0.153	0.173

Notes: The sample is limited to Foreign-born ethnic minorities. Robust standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A3. Impact of 9/11 on Education Sorting in Intermarriage for Muslims - Robustness Checks

	Own Years of Schooling					
	Male			Female		
	(1)	(2)	(3)	(1)	(2)	(3)
Intermarriage	0.917***	0.957***	0.785***	1.135***	1.221***	1.158***
	(0.298)	(0.298)	(0.278)	(0.229)	(0.230)	(0.229)
Post 9/11	1.352**	1.310**	1.182*	3.357***	3.219***	2.948***
	(0.609)	(0.607)	(0.618)	(0.494)	(0.494)	(0.503)
Intermarriage × Post 9/11	-1.223***	-1.213***	-1.149***	-1.009***	-1.011***	-0.923***
	(0.334)	(0.334)	(0.316)	(0.260)	(0.258)	(0.257)
Group share by state	No	Yes	No	No	Yes	No
State FE	No	No	Yes	No	No	Yes
Year of Marriage FE	Yes	Yes	Yes	Yes	Yes	Yes
Year of Survey FE	Yes	Yes	Yes	Yes	Yes	Yes
Cohort FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3,491	3,491	3,491	4,389	4,389	4,389
R^2	0.063	0.065	0.107	0.129	0.135	0.163

Notes: The sample is limited to US-born Muslims. Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A4. Impact of 9/11 on Education Sorting in Intermarriage for Muslims - Robustness Checks

	Own College Education					
	Male			Female		
	(1)	(2)	(3)	(1)	(2)	(3)
Intermarriage	0.139***	0.146***	0.118***	0.137***	0.142***	0.136***
	(0.041)	(0.041)	(0.038)	(0.031)	(0.032)	(0.031)
Post 9/11	0.042	0.034	0.015	0.307***	0.301***	0.288***
	(0.079)	(0.079)	(0.081)	(0.064)	(0.064)	(0.064)
Intermarriage × Post 9/11	-0.155***	-0.153***	-0.133***	-0.105***	-0.106***	-0.097***
	(0.045)	(0.045)	(0.042)	(0.035)	(0.035)	(0.035)
Group share by state	No	Yes	No	No	Yes	No
State FE	No	No	Yes	No	No	Yes
Year of Marriage FE	Yes	Yes	Yes	Yes	Yes	Yes
Year of Survey FE	Yes	Yes	Yes	Yes	Yes	Yes
Cohort FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3,491	3,491	3,491	4,389	4,389	4,389
R^2	0.065	0.067	0.104	0.090	0.091	0.117

Notes: The sample is limited to US-born Muslims. Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A5. Impact of 9/11 on Education Sorting in Intermarriage for White Americans - Robustness Checks

	Own Years of Schooling					
	Male			Female		
	(1)	(2)	(3)	(1)	(2)	(3)
Intermarriage	1.477***	1.379***	1.269***	0.888***	0.829***	0.730***
	(0.091)	(0.091)	(0.091)	(0.072)	(0.072)	(0.072)
Post 9/11	-0.361***	-0.389***	-0.400***	0.452***	0.433***	0.395***
	(0.025)	(0.025)	(0.024)	(0.024)	(0.024)	(0.023)
Intermarriage × Post 9/11	-0.189*	-0.186*	-0.204*	-0.231**	-0.233**	-0.243***
	(0.111)	(0.111)	(0.111)	(0.092)	(0.092)	(0.091)
Group share by state	No	Yes	No	No	Yes	No
State FE	No	No	Yes	No	No	Yes
Year of Marriage FE	Yes	Yes	Yes	Yes	Yes	Yes
Year of Survey FE	Yes	Yes	Yes	Yes	Yes	Yes
Cohort FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,131,902	2,131,902	2,131,902	2,187,049	2,187,049	2,187,049
R^2	0.013	0.018	0.036	0.032	0.034	0.052

Notes: The sample is limited to US-born Whites. Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A6. Impact of 9/11 on Education Sorting in Intermarriage for White Americans - Robustness Checks

	Own College Education					
	Male			Female		
	(1)	(2)	(3)	(1)	(2)	(3)
Intermarriage	0.175***	0.159***	0.146***	0.114***	0.106***	0.095***
	(0.012)	(0.012)	(0.012)	(0.011)	(0.011)	(0.011)
Post 9/11	-0.048***	-0.052***	-0.052***	0.045***	0.043***	0.039***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Intermarriage × Post 9/11	-0.016	-0.015	-0.017	-0.043***	-0.044***	-0.045***
	(0.015)	(0.015)	(0.015)	(0.013)	(0.013)	(0.013)
Group share by state	No	Yes	No	No	Yes	No
State FE	No	No	Yes	No	No	Yes
Year of Marriage FE	Yes	Yes	Yes	Yes	Yes	Yes
Year of Survey FE	Yes	Yes	Yes	Yes	Yes	Yes
Cohort FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,131,902	2,131,902	2,131,902	2,187,049	2,187,049	2,187,049
R^2	0.012	0.017	0.030	0.028	0.030	0.042

Notes: The sample is limited to US-born Whites. Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A7. Impact of 9/11 on Education Trade-off in Intermarriage for Muslims - Robustness Checks

	Spouse's Years of Schooling					
	Male			Female		
	(1)	(2)	(3)	(1)	(2)	(3)
Intermarriage	0.400*	0.411*	0.462**	-0.169	-0.172	-0.203
	(0.224)	(0.226)	(0.225)	(0.215)	(0.216)	(0.212)
Post 9/11	0.396	0.407	0.713	2.979***	2.941***	2.809***
	(1.407)	(1.406)	(1.305)	(0.547)	(0.548)	(0.610)
Intermarriage × Post 9/11	-0.254	-0.251	-0.301	-0.579**	-0.573**	-0.477*
	(0.262)	(0.262)	(0.258)	(0.247)	(0.247)	(0.244)
Years of Schooling	0.481***	0.481***	0.473***	0.574***	0.571***	0.564***
	(0.029)	(0.029)	(0.029)	(0.032)	(0.032)	(0.032)
College Education	0.314	0.311	0.325	-0.058	-0.045	-0.055
	(0.206)	(0.207)	(0.202)	(0.216)	(0.216)	(0.214)
Age of Marriage	0.034	0.033	0.025	-0.073***	-0.073***	-0.075***
	(0.054)	(0.054)	(0.050)	(0.018)	(0.018)	(0.020)
Group share by state	No	Yes	No	No	Yes	No
State FE	No	No	Yes	No	No	Yes
Year of Marriage FE	Yes	Yes	Yes	Yes	Yes	Yes
Year of Survey FE	Yes	Yes	Yes	Yes	Yes	Yes
Cohort FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3,491	3,491	3,491	4,389	4,389	4,389
R^2	0.314	0.314	0.336	0.323	0.323	0.337

Notes: The sample is limited to US-born Muslims. Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A8. Impact of 9/11 on Education Trade-off in Intermarriage for Muslims - Robustness Checks

	Spouse's College Education					
	Male			Female		
	(1)	(2)	(3)	(1)	(2)	(3)
Intermarriage	0.045	0.040	0.045	-0.000	0.001	-0.005
	(0.034)	(0.035)	(0.033)	(0.030)	(0.031)	(0.030)
Post 9/11	-0.044	-0.049	-0.019	0.160**	0.151**	0.148*
	(0.232)	(0.233)	(0.218)	(0.073)	(0.074)	(0.081)
Intermarriage × Post 9/11	0.002	0.001	-0.002	-0.044	-0.043	-0.026
	(0.039)	(0.039)	(0.038)	(0.035)	(0.035)	(0.034)
Years of Schooling	0.030***	0.030***	0.030***	0.043***	0.042***	0.041***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
College Education	0.205***	0.207***	0.205***	0.180***	0.183***	0.180***
	(0.035)	(0.035)	(0.034)	(0.035)	(0.035)	(0.034)
Age of Marriage	0.002	0.002	0.002	-0.002	-0.002	-0.003
	(0.009)	(0.009)	(0.008)	(0.002)	(0.002)	(0.002)
Group share by state	No	Yes	No	No	Yes	No
State FE	No	No	Yes	No	No	Yes
Year of Marriage FE	Yes	Yes	Yes	Yes	Yes	Yes
Year of Survey FE	Yes	Yes	Yes	Yes	Yes	Yes
Cohort FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3,491	3,491	3,491	4,389	4,389	4,389
R^2	0.210	0.212	0.239	0.225	0.227	0.248

Notes: The sample is limited to US-born Muslims. Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A9. Impact of 9/11 on Education Trade-off in Intermarriage for White Americans - Robustness Checks

	Spouse's Years of Schooling					
	Male			Female		
	(1)	(2)	(3)	(1)	(2)	(3)
Intermarriage	0.589***	0.578***	0.529***	1.028***	0.978***	0.940***
	(0.076)	(0.076)	(0.076)	(0.076)	(0.076)	(0.075)
Post 9/11	0.144*	0.145*	0.151*	-0.482***	-0.494***	-0.489***
	(0.086)	(0.086)	(0.085)	(0.123)	(0.122)	(0.123)
Intermarriage × Post 9/11	-0.081	-0.082	-0.094	-0.061	-0.066	-0.071
	(0.097)	(0.097)	(0.096)	(0.093)	(0.093)	(0.093)
Years of Schooling	0.442***	0.441***	0.433***	0.523***	0.522***	0.514***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
College Education	0.341***	0.347***	0.344***	0.123***	0.112***	0.108***
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)
Age of Marriage	0.004	0.004	0.003	0.007	0.007	0.007
	(0.003)	(0.003)	(0.003)	(0.005)	(0.005)	(0.005)
Group share by state	No	Yes	No	No	Yes	No
State FE	No	No	Yes	No	No	Yes
Year of Marriage FE	Yes	Yes	Yes	Yes	Yes	Yes
Year of Survey FE	Yes	Yes	Yes	Yes	Yes	Yes
Cohort FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,131,902	2,131,902	2,131,902	2,187,049	2,187,049	2,187,049
R^2	0.279	0.280	0.285	0.268	0.270	0.274

Notes: The sample is limited to US-born Whites. Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A10. Impact of 9/11 on Education Trade-off in Intermarriage for White Americans - Robustness Checks

	Spouse's College Education					
	Male			Female		
	(1)	(2)	(3)	(1)	(2)	(3)
Intermarriage	0.059***	0.056***	0.051***	0.113***	0.105***	0.101***
	(0.011)	(0.011)	(0.011)	(0.010)	(0.010)	(0.010)
Post 9/11	0.044***	0.043***	0.045***	-0.057***	-0.060***	-0.058***
	(0.017)	(0.017)	(0.017)	(0.019)	(0.019)	(0.019)
Intermarriage × Post 9/11	-0.024*	-0.024*	-0.024*	-0.001	-0.002	-0.003
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)
Years of Schooling	0.038***	0.038***	0.037***	0.051***	0.051***	0.050***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
College Education	0.172***	0.171***	0.170***	0.155***	0.152***	0.150***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Age of Marriage	-0.001	-0.001	-0.001	0.001	0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Group share by state	No	Yes	No	No	Yes	No
State FE	No	No	Yes	No	No	Yes
Year of Marriage FE	Yes	Yes	Yes	Yes	Yes	Yes
Year of Survey FE	Yes	Yes	Yes	Yes	Yes	Yes
Cohort FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,131,902	2,131,902	2,131,902	2,187,049	2,187,049	2,187,049
R^2	0.190	0.190	0.193	0.191	0.194	0.198

Notes: The sample is limited to US-born Whites. Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

B Sample Construction

The sample is constructed from the American Community Survey (2010-2019). I restrict the sample to married individuals and further require that spouses can be identified in the data. Focusing on US-born individuals reduces the sample substantially for Muslims compared to non-Muslims. After excluding cases of marriage migration and applying age restrictions, I finally restrict to marriages that occurred between 1990-2015, yielding my final analysis sample. Details of change in number of observations in each round is reported in Table B1.

Table B1. Sample Selection

	Non-Muslim		Muslim	
	Count	Δ%	Count	Δ%
Total	37,217,420		313,733	
Married	15,920,512	-57.22	148,434	-52.69
Spouse identified	15,285,205	-3.99	138,721	-6.54
US-born	12,822,064	-16.11	15,232	-89.02
No marriage migration	12,677,242	-1.13	13,735	-9.83
Age limit	11,554,012	-8.86	13,139	-4.34
Marriages between 1990-2015	5,949,468	-48.51	9,512	-27.60

C Muslim Classification Methodology

This appendix provides a detailed explanation of my methodology to identify Muslim individuals in the American Community Survey (ACS) data. My identification strategy relies primarily on ancestry information, supplemented by country of birth for immigrants and language information for specific cases.

1. Primary Classification: Ancestry-Based Identification

My primary method of identification uses responses to the ACS ancestry question (What is this person's ancestry or ethnic origin?). I classify individuals as Muslim if their first reported ancestry corresponds to predominantly Muslim countries or ethnic groups (with more than 70% Muslim population). This includes:

1. Middle Eastern and North African origins: Arab countries (e.g., Egyptian, Iraqi, Jordanian, Kuwaiti), North African countries (e.g., Algerian, Moroccan, Tunisian), Persian/Iranian ancestry, Turkish and Kurdish ancestry
2. Central and South Asian origins: Afghan, Pakistani, Bangladeshi, Central Asian ethnicities (e.g., Uzbek, Azerbaijani)
3. Sub-Saharan African Muslim regions: Horn of Africa (e.g., Somali), West African Muslim regions (e.g., Gambian, Senegalese)

2. Secondary Classification: Birth Country-Based Identification

For foreign-born individuals with missing ancestry information, I use answer to the birth place question (Where was this person born?) as the basis for classification. This includes individuals born in:

1. Middle Eastern and North African countries: Gulf states (e.g., Saudi Arabia, UAE, Kuwait), Levant region (e.g., Syria, Jordan), North Africa (e.g., Egypt, Libya, Morocco)
2. Central and South Asian countries: Afghanistan, Pakistan, Bangladesh, Central Asian republics (e.g., Uzbekistan, Kazakhstan)
3. Southeast Asian Muslim countries: Indonesia, Brunei

3. Tertiary Classification: Language-Based Refinement

For individuals with Indian ancestry, I use language information to identify Muslims. I classify individuals as Muslim if they speak Urdu.

D Ethnic Group Classification Methodology

I classify individuals into eight mutually exclusive groups based on first response to ancestry question (What is this person's ancestry or ethnic origin?) and birthplace question (Where was this person born?). Since ancestry is consistently reported for most of the population and does not depend on the immigration status, I prioritizes ancestry, but for foreign-born individuals, when ancestry is non-specific, I use birthplace to determine the group. Below are the detailed classifications:

1. White: Includes individuals of Western European, Eastern European, Nordic, Southern European, and Baltic origin, as well as those from the United States, Canada, and Oceania (ancestry codes 1-98, 100-195, 800-870, 931-990; or birthplace codes 1-56, 150, 400-465, 700, 710 when ancestry is non-specific)
2. Mexico, Central America, and Caribbean: Includes individuals from these regions (ancestry codes 210-219, 261, 271, 300-337; or birthplace codes 200, 210, 250, 110, 260 when ancestry is non-specific)
3. South America: Includes all South American origins (ancestry codes 231-239, 360, 248; or birthplace code 300 when ancestry is non-specific)
4. North Africa and Middle East: Includes non-Mudlim individuals from these regions, including Iran (ancestry codes 400-496; or birthplace codes 530-549, 522 when ancestry is non-specific)
5. Sub-Saharan Africa: Includes all Sub-Saharan African origins (ancestry codes 500-599; or birthplace codes 600-699 when ancestry is non-specific)
6. South Asia: Includes non-Muslim individuals from the Indian subcontinent (ancestry codes 600-695; or birthplace codes 520-529 when ancestry is non-specific)
7. East and Southeast Asia: Includes non-Muslim individuals from these regions (ancestry codes 700-796; or birthplace codes 500-519 when ancestry is non-specific)
8. Muslim: Includes all individuals identified as Muslim regardless of their ethnic origin

E Construction of Years of Schooling Variable

To make a continuous education measure, I convert educational attainment categories into years of schooling using the following mapping:

- No schooling/Preschool: 0 years
- Elementary Education:
  - Kindergarten: 1 year
  - Grades 1-4: Corresponding number of years (1-4)
  - Grades 5-8: Corresponding number of years (5-8)
- Secondary Education:
  - Grades 9-11: Corresponding number of years (9-11)
  - Grade 12/High School Graduate/GED: 12 years
- Post-Secondary Education:
  - Some college, less than 1 year: 13 years
  - One or more years of college, no degree: 14 years
  - Associate's degree: 14 years
  - Bachelor's degree: 16 years
  - Master's degree: 18 years
  - Professional degree beyond bachelor's: 19 years
  - Doctoral degree: 21 years

F Impact of 9/11 on Single-hood and Separation/Divorce Rates: Evidence from CPS Data

For the analysis of separation rates, I utilize data from the Current Population Survey (CPS) spanning 1995-2015 (US Census Bureau and US Bureau of Labor Statistics, 2015). The CPS, administered monthly by the US Bureau of Census, provides detailed information on marital status, including whether individuals are separated from their spouses. While the CPS has been conducted since 1976, I begin the analysis in 1995 due to a significant revision in 1994 that introduced questions about birthplace. The 1994 dataset has incomplete coverage of countries of birth as some country codes were only introduced in 1995. To maintain consistent identification of the Muslim population through parents' country of birth, I restrict the sample to 1995 onwards.

In this analysis I focus on second-generation immigrants, defined as individuals born in the United States whose fathers were born abroad. Following the main analysis, I compare separation rates between Muslims and other minority groups, examining how these patterns changed after 9/11, using the following specification:

$$Y_{ist} = \beta_1 \text{Muslim}_i + \beta_2 \text{Post9/11}_t + \beta_3 (\text{Muslim}_i \times \text{Post9/11}_t) + X_i'\gamma + \delta_t + \theta_s + \alpha_g + (\theta_s \times \alpha_g) + \varepsilon_{ist}$$

where Y_{ist} is a binary indicator for whether individual i in state s at time t is divorced or separated from their spouse. The coefficient of interest, β_3, captures how the likelihood of separation for Muslims changed after 9/11 relative to other minority groups.

The results in Table E1 show that while Muslims have higher baseline rates of separation (1.1 percentage points), there was no significant change in separation rates for Muslims relative to other minorities after 9/11. This supports the validity of the identification strategy, as it indicates that 9/11 did not systematically affect the dissolution of existing marriages differently for Muslims compared to other minorities.

Table E1. Effect of 9/11 on Separation/Divorce

Dependent variable: Separated/Divorced			
	All	Male	Female
Muslim	0.011***	0.011**	0.010**
	(0.003)	(0.005)	(0.005)
Post 9/11	-0.000	0.008	-0.008
	(0.005)	(0.007)	(0.007)
Muslim × Post 9/11	-0.003	-0.004	-0.001
	(0.004)	(0.005)	(0.005)
Years of Schooling	-0.007***	-0.004***	-0.011***
	(0.000)	(0.000)	(0.000)
College Education	0.003**	-0.004**	0.006***
	(0.001)	(0.002)	(0.002)
Observations	436,815	198,003	238,812
R^2	0.065	0.056	0.083

Notes: The sample is limited to second-generation ethnic minorities. All regressions control for state × group fixed effects, year of marriage fixed effects, year of survey fixed effects, and cohort fixed effects. Robust standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table E2. The effect of 9/11 on Singlehood

Dependent variable: Single/Never-married			
	All	Male	Female
Muslim	-0.003	-0.006	-0.001
	(0.006)	(0.008)	(0.007)
Post 9/11	-0.006	-0.009	-0.006
	(0.008)	(0.013)	(0.010)
Muslim × Post 9/11	-0.026***	-0.013	-0.035***
	(0.006)	(0.009)	(0.009)
Years of Schooling	-0.003***	-0.005***	0.001*
	(0.000)	(0.001)	(0.001)
College Education	0.049***	0.044***	0.063***
	(0.002)	(0.003)	(0.003)
Observations	436,815	198,003	238,812
R^2	0.364	0.364	0.382

Notes: The sample is limited to second-generation ethnic minorities. All regressions control for state × group fixed effects, year of marriage fixed effects, year of survey fixed effects, and cohort fixed effects. Robust standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

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