Insight to MSU's Applicant Funnel: An Introduction & Foundation

Fall 2022, 2023, and 2024 Incoming Classes

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Highlights

Delaying the deposit deadline from 01/May to 01/June for the FS24 incoming class did not negatively impact the number of deposits. See Application Funnel.

MSU is centrally located for most applicants. For the past three incoming classes, 75% of Deposits and 57% of Cancels reside within 100 miles of MSU. See Distance to MSU.

A majority of October, November, and December Admits become April Deposits. See Applicant Admit - Deposit - Cancel Relationships.

High school GPA of Admits degrades over time while remaining moderately constant for Cancels. See Community Median Income - High School GPA Relationship.

In-state applicants who Cancel look more like Admits than Deposits. This does not apply to out-of-state applicants to the same extent. See Cancelling a Deposit is a Reversion to the Admit State.

The focus should be on why MSU applicants select institutions other than MSU and the University of Michigan (UoM; *n*=5,988; 10.6% of all applicants selecting other institutions) since the top 10 selected institutions (not including UoM) account for 14,650 (29.0%) of applicants attending other institutions. Additionally, since UoM is selected almost 3 to 1 over the next most popular institution (University of Indiana – Bloomington; *n*=2,070), UoM can muddle the analysis and divert attention to other important features and ideas. See Selection of Another Institution.

An overwhelming majority of MSU applicants who decide to attend Wayne State University (WSU) live less than 40 miles from WSU. See Distance to MSU.

About This Document

This document[1] provides an overview of the fall 2022 (FS22), fall 2023 (FS23), and fall 2024 (FS24) incoming classes using socioeconomic data and data from Slate applications and the National Student Clearinghouse. The study is a historical perspective focused on the varied composition of applicants – within and between admission funnel components – and provides a starting point and foundation for future questions, analyses, and reports on applicants and their behaviors.

Throughout the application cycle, the topic of how many applicants have decided to cancel their deposits – commonly and confusingly called melt[2] – and not be part of the upcoming incoming class is discussed superficially. MSU's large application base (55k for the FS22 incoming class to 65k for the FS24 incoming class) and large incoming classes (~10k students) allow us to explore applicants' overall features at each stage of the admissions funnel while focusing on specific cohorts.

The Predictive Analytics Group (PAG) understands that our work differs from previous studies at MSU and other higher education institutions.[3] Thus, we took great care to create insightful, information-dense, yet easy-to-understand plots (aka charts or graphs). The findings should be understandable by anyone working within Enrollment Services or adjacent offices. This document should spark discussions, and we encourage everyone to ask questions about the information presented. We define our lexicon to reduce confusion and ensure a common frame of reference. Please see the About the Predictive Analytics Group section for more information about PAG.

[1] The document's layout differs slightly from what one might be accustomed to. The Highlights contain a general overview and talking points. The Introduction provides context and background. The Results & Discussion presents the results and discuss their interpretation. The Conclusion frames the findings compared to historical perspectives. The Materials & Methods details the data and analysis methods used to generate the results.

[2] The Predictive Analytics Group (PAG) within Enrollment and Academic Strategic Planning no longer uses the term ***melt*** to describe those cancelling their deposits to MSU. While used by numerous institutions and offices, the term ***melt*** is ambiguous because it is applied to those who ***withdraw*** during the quarter term of their first semester at an institution. For these reasons, PAG uses the term ***cancel*** for those who cancel their deposits and ***withdraw*** for those withdrawing on or after the first day of class in their term.

[3] The views, opinions, and recommendations, explicit or implied, are those of the Predictive Analytics Group (PAG) and not the leadership/management of the Office of Enrollment and Academic Strategic Planning and its subsidiaries.

Introduction

The presented analysis attempts to view and understand applicants as combinations of their features. Rarely does a single feature impact or dictate an outcome; instead, a combination of features contributes to an outcome. To gain insight into why applicant cohorts behave in specific ways, features (attributes and characteristics of an applicant) are discussed and evaluated as singular features and combinations of features.

Typically, discussions about applicant features focus on a single feature without considering multiple contributing features or that multiple possible reasons exist for a collection of applicants. The over-compartmentalization of reasons an applicant decides not to attend MSU and the desire to identify a single feature to allocate resources does not adequately address the manifold possibilities. The frequent rushing of the discussion and the desire for a simplistic PowerPoint presentation add to the incomplete view of why applicants decide to attend MSU. There are numerous reasons for cancelling a deposit, but the focus herein is on socioeconomics and demographics that may or may not capture all or some of the reasons for all cancelling applicants. It is important to remember that an applicant selects a different institution that fulfills their definition of ideal at the time of their decision.[4]

The selected community-based (zip code) features (population, demographic, and socioeconomic) are based on those commonly discussed and included in the community description. Individually, these features do not define a community, but when combined, they provide a general perception that allows comparisons. While numerous factors contribute to an applicant's decision to deposit and attend classes at MSU, this report focuses on traditional features such as the applicant's high school grade point average (GPA), the median income of the applicant's community (zip code), the community's racial demographics, housing (percent home ownership and occupancy and median cost), the community's academic achievement (percentage of the community with a bachelor's degree or more), and unemployment rate.

The results herein challenge the conventional paradigm of a linear admissions funnel, with applicants only able to progress through the funnel. While this is understandable from an Office of Admissions perspective and supports a bookkeeping mindset to track specific

[4] The phrase "fulfills their definition of ideal" is used instead of "a better institution" because the applicant has multiple internal reasons for selecting an institution often outside the scope of simplistic rankings. All MSU applicants who decide to attend another institution are making the best decision for themselves at that moment based on their life experiences and the needs they are attempting to satisfy.

actions and states of applicants, the presented analysis suggests that those who deposit and later cancel their deposit are *reverting* their status to admit.

Results & Discussion

Applicants are divided into four cohorts based on their location in the admissions funnel. PAG defines four sequential funnel classifications (Submit, Admit, Deposit, and Cancel) that build on the applicant's previous classification within the application funnel. An applicant cannot occupy a later funnel state without occupying a previous funnel state.

- **Submit**: applied and ***not*** admitted
- **Admit**: applied and admitted
- **Deposit**: applied, admitted, and deposited
- **Cancel**: applied, admitted, deposited, and cancelled deposit

Application Funnel

MSU starts accepting applications for the preceding year's incoming class on the first day of August, *e.g.*, applications opened on 01/Aug/2024 for the fall 2025 incoming class. For the past three incoming classes (FS22, FS23, and FS24), the Office of Admissions (OoA) has had three different initial days of informing applicants they were admitted to MSU. In FS22, the first notification of admittance was 04/Nov/2021; for FS23, it was 03/Oct/2022; and for FS24, it was 18/Oct/2023. Though not evident from this small sample, historically, MSU informs applicants of their admission status in mid-October. The delay in notifying FS22 admittees was due to delays in receiving admit packet materials due to supply chain issues. The earlier-than-normal admit announcement date for FS23 was due to an internal administrative decision by the OoA to notify admitted applicants earlier than mid-October. In contrast, the FS24 admission date reflects the historical practice of starting to notify applicants of their admissions to MSU during mid-October.

In the past three years, the number of applicants has increased, and with this increase, the number and proportion (fraction or percentage) of applicants not admitted to MSU has increased; see Figure 1. The number of applicants admitted to MSU and deciding not to deposit (Admit) has increased while the percentage remained relatively constant. The declining yield rate (percentage of applicants who deposit) is expected as the number of applicants increases. The number of deposits for FS22 and FS24 is almost the identical (9,776 versus 9,787, respectively), yet the percentage changes by 3% (18% versus 15%, respectively) due to the significant change in the number of applications for these two incoming classes (55,516 versus 64,445, respectively). Figure 1 demonstrates how percentages do not adequately capture subcohort changes.

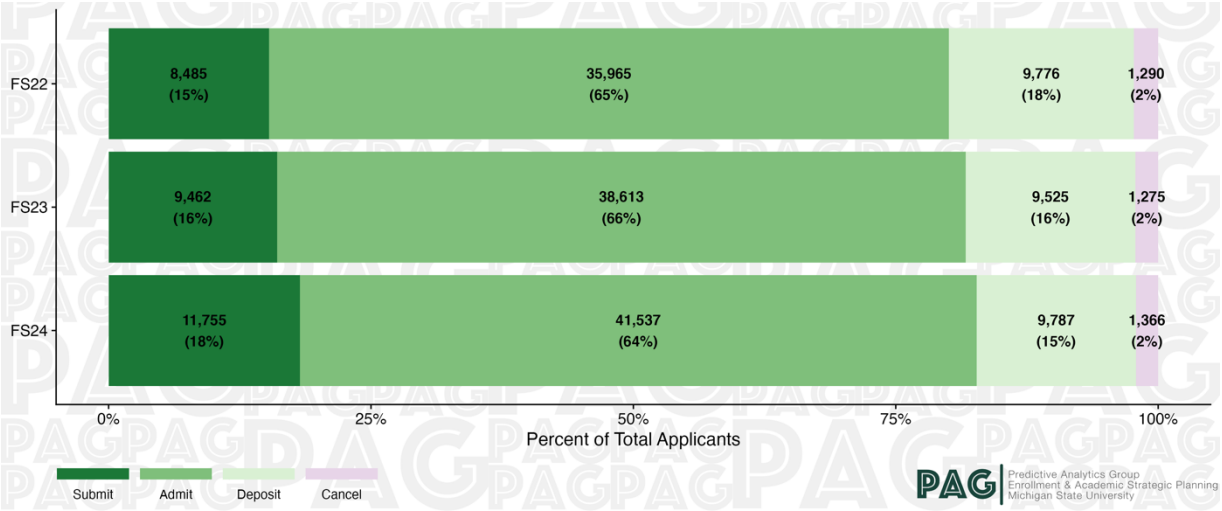

Figure 1. Funnel Contribution. The number of applicants in each part of the funnel for FS22, FS23, and FS24.

Funnel Timeline

Each incoming class's application funnel percentage milestones are remarkably consistent over the three years of interest when considering 50% and 95% completion. The 100% completion for submitted applications and admitted applicants fluctuate to achieve the desired incoming class size. For FS22, 100% of submitted and admitted applicants are reached several months after the 99% rate and after 100% of deposits. FS23 and FS24 have similar achievement trends regarding the percentage of Submits, Admits, and Deposits; notice that 100% of deposits occur shortly before (FS23) or on (FS24) the first day of classes. Most applicants are admitted during October, November, and December of the year preceding the incoming class; see Figure 2.

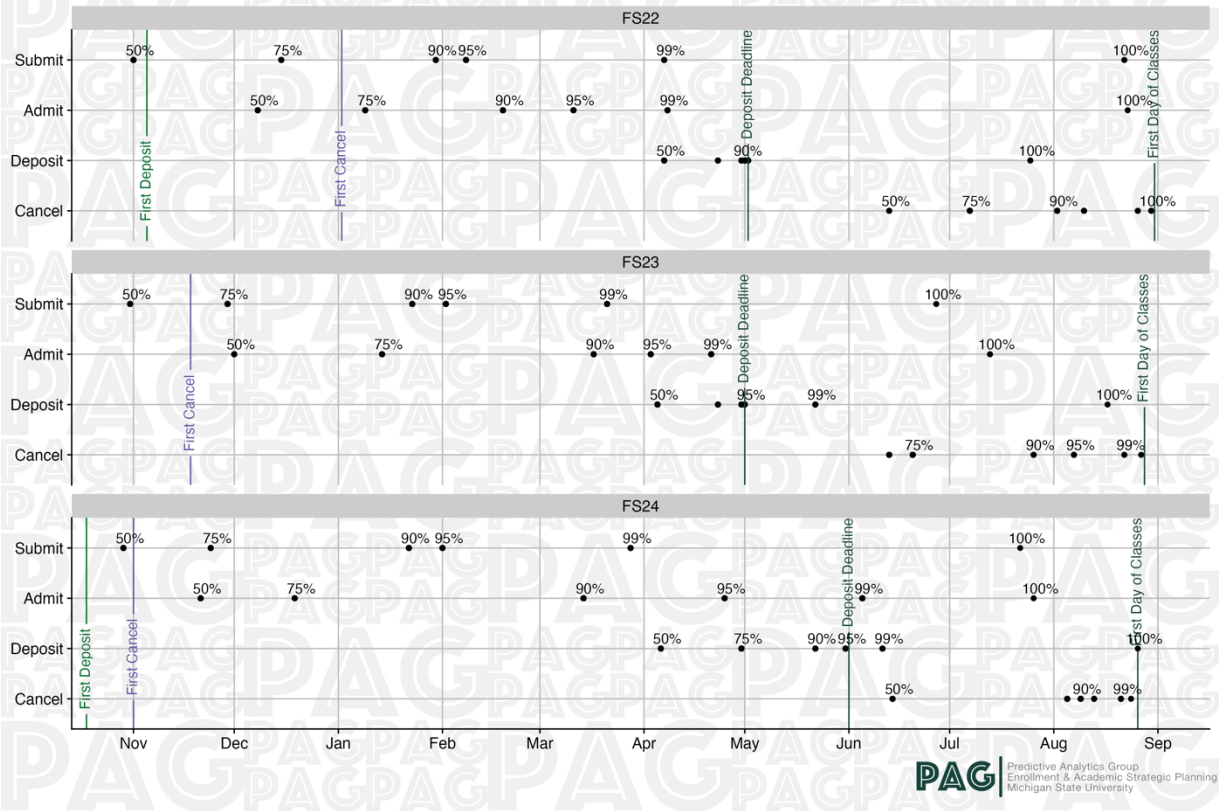

Figure 2. Percentage of Funnel Over Time.

While cancellations start occurring in the preceding fall, approximately half of the cancellations occur in the two and a half months (mid-June) before the first day of the fall semester. Reaching the cancellation milestone of 50% appears to be independent of the deposit deadline, yet for FS24, the delayed deposit deadline appears to delay reaching 75%, 90%, and 95% cancellation milestones. Almost half of deposits occur during the month preceding the deposit deadline, though moving the deadline from 01/May to 01/June for the FS24 incoming class shifted the three-quarter point by approximately a week and the final 25% of deposits occurred in during May/2024. This contrasts with approximately 25% of deposits previously occurring the week before the deposit deadline (FS22 and FS23).

The date for reaching the 50% mark of deposits and cancellations is relatively consistent for the past three incoming classes. Thus, it is unlikely that MSU's delayed deposit deadline influenced those depositing or cancelling, and it is likely that external factors contributed to their decision. Additionally, there is no indication that the loss of the deposit ($250) was a barrier to cancellation. Caution should be taken with this finding as it is based on a single incoming class and these observations are likely influenced by the mayhem surrounding the 2024 FASFA submission cycle and financial aid awards at institutions not

employing the CSS Profile service to determine financial aid packages. It is possible those who cancelled in August 2024 were waiting for financial aid packages from several institutions before deciding where or whether to attend an institution of higher education.

Applicant Admit – Deposit – Cancel Relationships

Illustrating the relationship between admitted applicants and when they deposit (Figure 3; green dots) and when applicants cancel their deposits (Figure 3; purple dots) draws a connection between the funnel milestones in Figure 2. Those admitted in October, November, and December for the upcoming class comprise 71.8% of those who deposit, with 64.5% depositing in the month immediately preceding the deposit deadline.[5] The vertical dark purple streaks occurring at the deposit deadline indicate those who deposit at the deposit deadline and quickly cancel their deposit. The horizontal purple streaks likely indicate when many applicants who deposited at MSU were notified they were admitted to another institution. For FS22 and FS23, there are distinct streaks shortly before the deposit deadlines, with additional cancellations of deposits happening in early and late June 2022, mid-June 2023, and early August 2024. The horizontal purple streak in the week preceding the deposit deadline is visible for FS22 and FS23, yet for FS24, the horizontal purple streak is present for the weeks preceding May 2024 and June 2024.

[5] FS24 is unique because a sizeable portion of deposits (34.5%) occurred during April 2024, with 18.4% received during May 2024; 52.9% of the FS24 deposits occurred in April and May 2024.

Figure 3. Deposit Date versus Admit & Cancel Date. The green dots represent the relationship between Admit and Deposit date. The purple dots represent the relationship between the Deposit and Cancel date.

Due to institutional changes to when applicants were admitted to MSU for each of the past three incoming classes, it is advantageous to visualize when applicants were admitted and when they deposited; see Figure 3. In all three incoming classes, a sizable proportion of October, November, and December admittees deposit in April. For FS24, those admitted in October, November, and December represented a majority (65.2%) of those depositing, with 26.1% depositing in April 2024 and 12.0% depositing in May 2024.

Caution needs to be used when evaluating the cancellation date as there may or may not be a relationship between an external event and the applicant cancelling their deposit. The distinctive bands in June for the FS22 and FS23 incoming classes are likely heavily influenced by the OoA sending messages (email and text) to applicants to cancel their deposits if they do not intend on enrolling at MSU. Ideally, the OoA would consistently send these messages starting in January, for example on the second Wednesday of each month until the first day of class, to ensure that those who do not wish to enroll, can cancel their application.

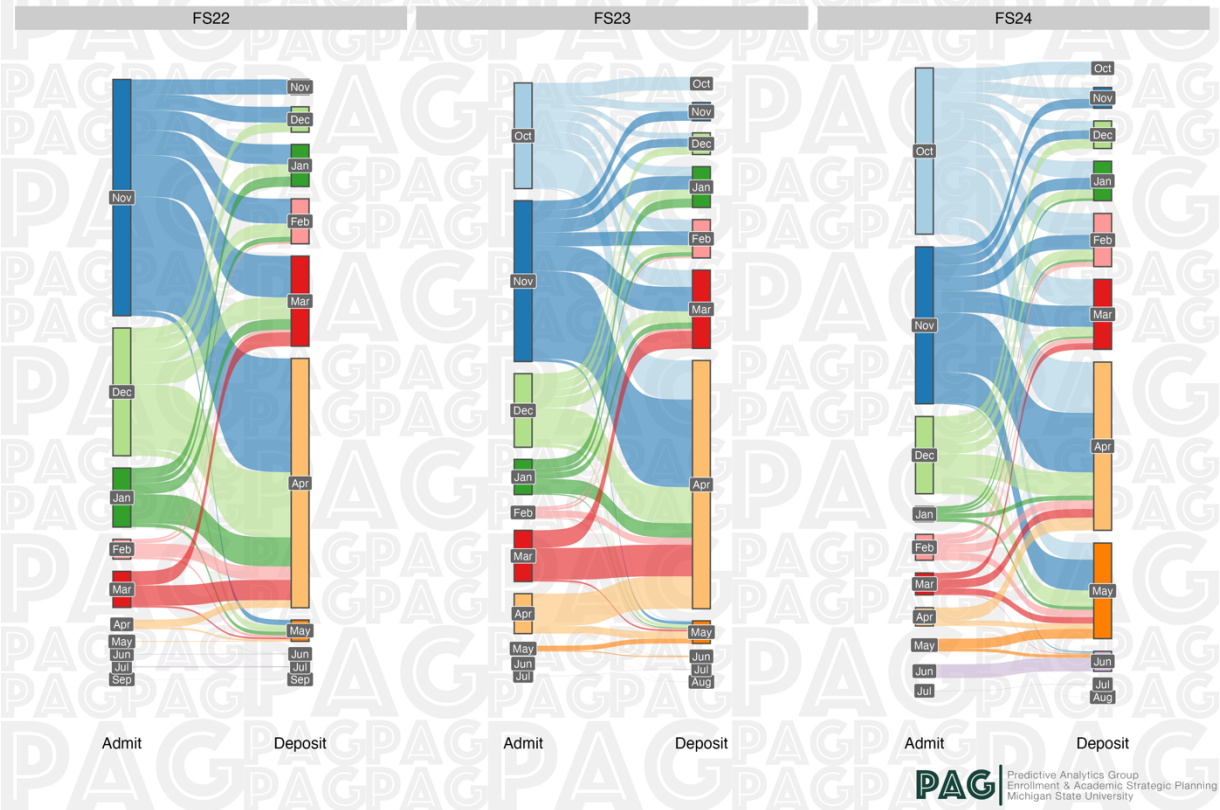

Figure 4. Admit Month to Deposit Month Relationship. Only depositors are illustrated in the alluvial plot, thus, those who are admitted and do not deposit are not part of the Admit cohort.

Considering only those who cancel, the temporal relationship between when an applicant is admitted, when they deposit, and when they cancel retains a similar Admit-Deposit pattern, with almost half of those depositing being admitted in October, November, and December. Almost two-thirds (64.8%) of those depositing in April cancel before the end of June; a similar percentage (59.1%) of those depositing in May also cancel before the end of June.

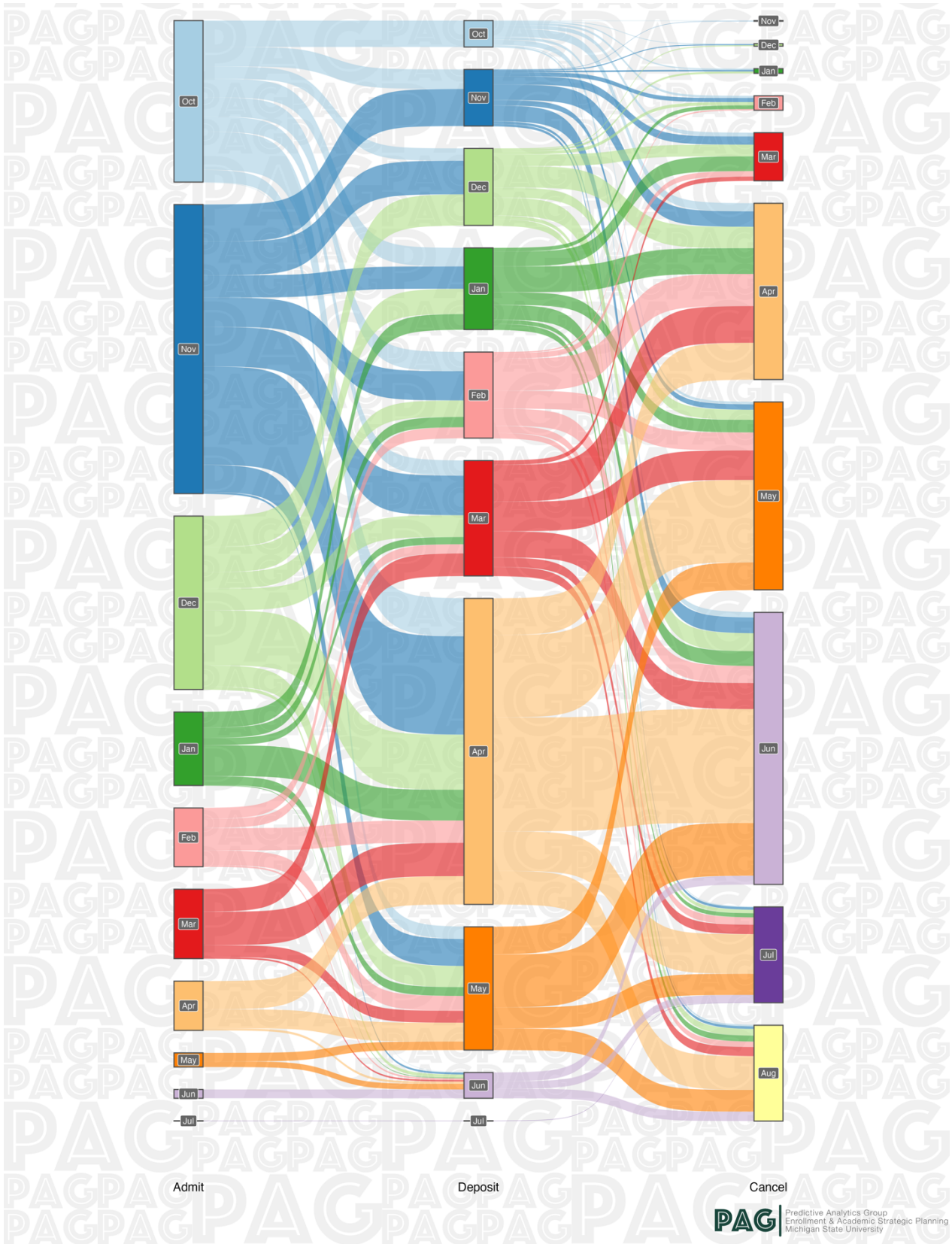

Figure 5. Admit Month to Deposit Month to Cancel Month Relationships. Only depositors are illustrated in the alluvial plot, thus, those who are admitted and do not deposit are not part of the Admit cohort.

Socioeconomic Relationship

To understand better the applicants' communities, several socioeconomic features are explored for all applicants: those who submit applications but are not admitted, those who are admitted, those who deposit, and those who cancel their deposits before the first day of class. The portion of the study uses a subset of community features (education, employment, housing, income, population, and race) and applicant-specific features (high school GPA and distance to MSU). Only applicants residing within the United States, attended high school within the United States, and are United States citizens are included in this analysis.

The selected community features can impact an individual's decision to attend higher education in several ways. The percentage of individuals within a community with a college degree sets the expectation that a college degree is both attainable and something to obtain. The community's income and housing occupancy, ownership, and value provide the funding for public education; often, the quality of public education is linked to these aspects of a community. Additionally, a higher income provides the ability for higher education and other educational endeavors during the applicant's high school career. The population size, density, and racial composition provide insight into the community's diversity and the potential for new experiences.

Analysis of the socioeconomic features of the applicants' communities illustrates common themes for the past three incoming classes (FS22, FS23, and FS24). Applicants are predominantly white from communities where almost half of the residents have at least a bachelor's degree[6] with a median income of $89.5k for in-state applicants and $112.3k for out-of-state applicants where home ownership is common and median home prices are higher, and the population density is low. These communities have a positive correlation with larger high school GPAs. A possible reason is a tax base with a larger overall value compared to other communities where MSU applicants originate.

To understand how these community features relate to each other for MSU applicants, they were evaluated using principal component analysis (PCA), relying only on the community's socioeconomic data and the applicant's high school GPA and distance to MSU. However, the applicants are separated into all applicants, in-state residents (Michigan), and out-of-state cohorts to illustrate similarities and differences.

[6] The median educational attainment (at least a bachelor's degree) for the communities of all applicants is 48.4%. The median educational attainment for in-state applicants' communities is 41.7% and 54.8% for out-of-state applicants.)

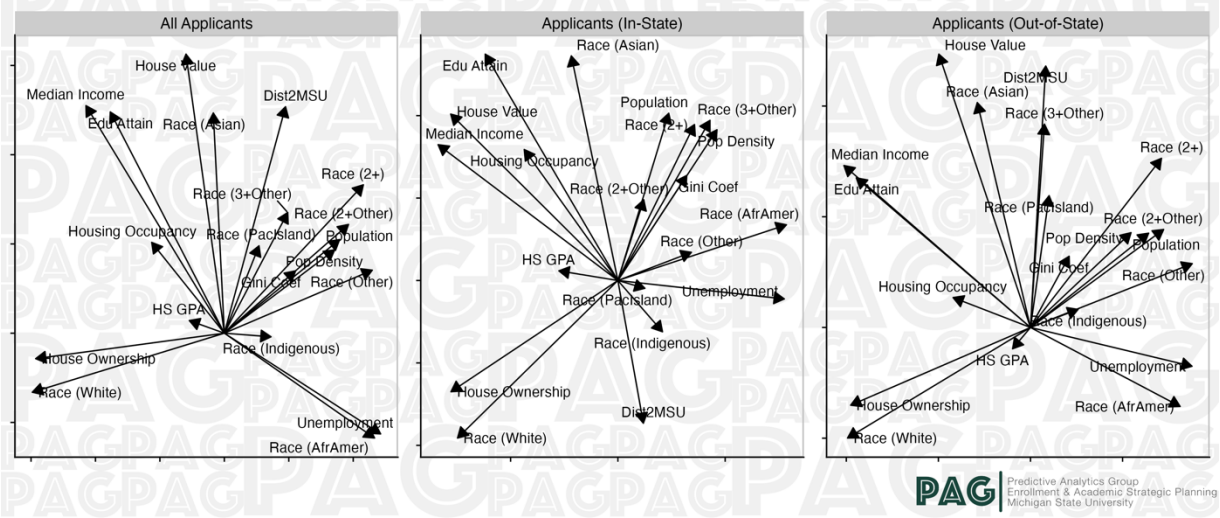

Figure 6. Socioeconomic Relationships. Biplots for the communities of applicants, in-state, and out-of-state applicants.

The biplots in Figure 6 illustrate the relationship between community features. The arrow's length indicates the feature's importance in the dataset. While the overall direction of the arrows does not contain a meaning, the directional relationship between arrows is important. Overlapping arrows, pointing in the same direction, indicate the features are likely correlated. Arrows pointing in opposite directions indicate the features have an inverse relationship. Perpendicular arrows indicate the features are not related. Often, biplots contain points (dots) representing the samples (applicants), but given the large number of applicants and numerous manners of classifying the applicants, the points are excluded. Likely due to the large number of applications under consideration, the biplots for all applicants, in-state, and out-of-state cohorts possess similar feature projections. When considering "All Applicants" (those who applied to the FS22, FS23, and FS24 incoming classes), key features are grouped; for brevity, the interpretation of only a few features is presented. Median income, educational attainment (Edu Attain; portion of the community with a bachelor's degree or more), and housing occupancy are correlated features. A possible explanation is that median income increases, as does educational attainment, and greater percentages of housing occupancy are linked to the compounding effects of higher incomes and educational attainment. Considering the inverse relationship between a community's median income and the percentage of unemployed residents, two possible interpretations are likely. A simplistic explanation is that the community's median income decreases as the unemployment percentage increases. Alternatively, using a regional economics approach, communities with a lower median income provide fewer employment opportunities. Thus, lower-income communities are likely to experience greater and prolonged periods of unemployment.

The distance to MSU (Dist2MSU) arrow points away from – and is an approximately equal distance (angles) from – the two arrows representing House Ownership and Race (White) and the two arrows representing Unemployment and Race (AfrAmer), indicating the distance to MSU is independent of these four features.

The communities for all applicants, in-state residents (Michigan), and out-of-state applicants (Figure 6) possess common distributions of the feature arrows. The main exception is the distance to MSU feature, indicating that the further from MSU an in-state applicant's community, the greater the educational attainment, median income, housing occupancy and value, the larger and denser the community's population, and the larger proportion of the community that is Asian. The high school GPA, house ownership, and Race (White) have a similar orientation for the out-of-state applicants.

Cancelling a Deposit is a Reversion to the Admit State

The procession of an applicant through the admissions funnel is seen as a linear process that starts with submitting an application and concludes with either enrolling through making a deposit or cancelling their deposit; Figure 8A.

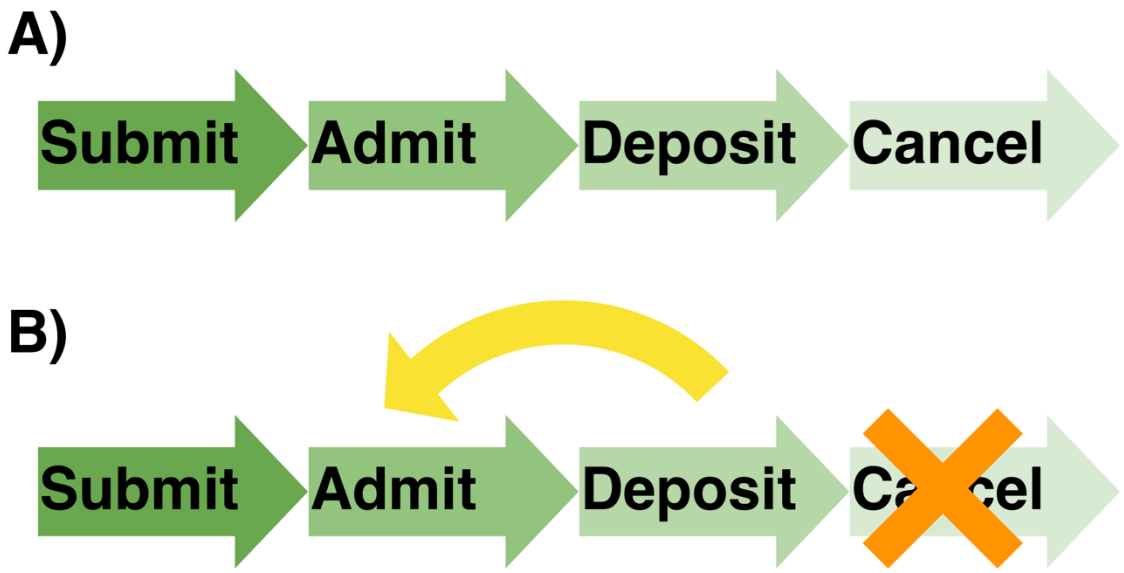

Figure 8. The Funnel State. A) The traditional view of the admission funnel. B) The proposed admission funnel where cancelling their deposit is a reversion to the Admit state.

The distributions of the individual socioeconomic features and academic achievement of the applicants for the all, in-state, and out-of-state applicant cohorts were compared for each of the funnel status classifications (Submit, Admit, Deposit, and Cancel). The

distribution comparison was accomplished using Welsh's Two Sample t-tests at the 99% confidence interval and Cohen's d analysis (not shown) to evaluate the size effects. Each feature was compared between all application funnel pairs (Sub-Adm, Sub-Dep, Sub-Can, Adm-Dep, Adm-Can, and Dep-Can) within the three applicant cohorts (All Applicants, In-State, and Out-of-State). These distribution comparisons provide a framework to identify differences in the feature distribution between application funnel pairs ***within*** the three main residency cohorts. Comparisons ***between*** residency cohorts (All vs In-State, All vs Out-of-State, and In-State vs Out-of-State) were not considered. This analysis aimed to identify the funnel pairs with unique feature distributions between each other. The working assumption (hypothesis) is that the feature distributions between all funnel states are different regardless of residency.

Through the Welsh's Two Sample t-test, the socioeconomic, demographic, and educational ability and attainment distribution of community features for all funnel cohort pairs were investigated for All Applicants, In-State (Michigan resident) applicants, and Out-of-State applicants. Non-admitted applicants (Submit) generally have dissimilar distributions (based on *p*-values) than those admitted (Admit), deposited (Deposit), and cancelled (Cancel); see Tables 1, 2, and 3. Initially, it was assumed that Admit compared to Deposit and Cancel would have dissimilar distributions due to the inherent differences between the groups related to their actions.

The academic achievement (high school GPA) distributions for all residency types (All Applicants, In-State, and Out-of-State) and between all funnel status pairs are considered significantly different (p-values < 0.01) based on Welsh's Two Sample t-tests. Each cohort has a unique distribution compared to the other cohorts indicating that the academic achievement of applicants in each section of the funnel is, in a way, self-sorting. Figure 9 illustrates the considerable difference between the Submit cohort and the Admit, Deposit, and Cancel cohorts. The differences between the Admit, Deposit, and Cancel cohorts are modest but still visible with each possessing a distinct shape (distribution).

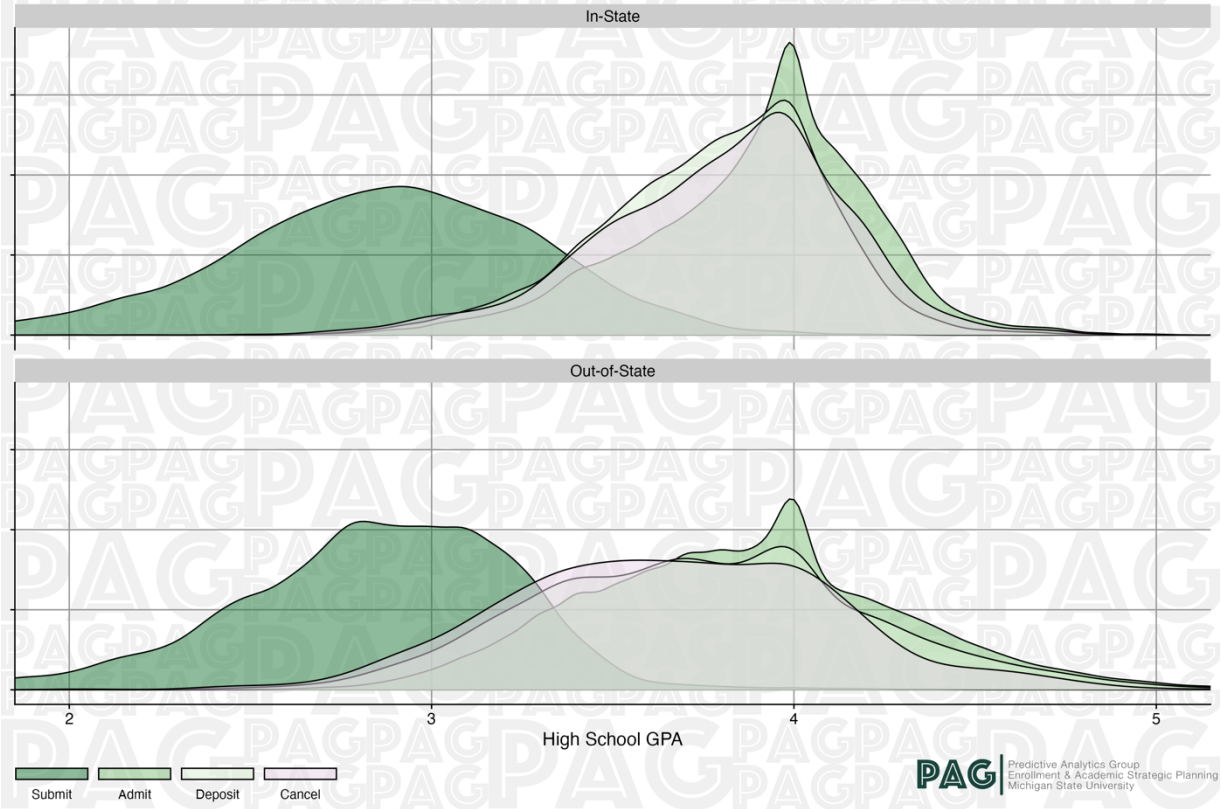

Figure 9. High School GPA Distribution by Funnel Status.

For example, those classified as Admits applied to MSU and were admitted, but MSU was not their preferred institution. Deposits view MSU as a good option for their specific goals. Cancels have a duality where they initially prefer MSU but then change their decision. Thus, they may have features similar to Deposit and Admits. Submits, overall, are expected to have little in common with the other three cohorts. These differences are expected as each cohort is unique and molded by their community's collective societal influences, ultimately shaping their decisions. Thus, applicants from similar communities are expected to exhibit similar behaviors resulting in similar MSU application outcomes. These communities have different distributions for their features and the applicants' high school GPA that separates them as a whole into different funnel states.

Table 1. Comparison Between Funnel Status (All Applicants). The *p*-values for the Welsh's Two Sample t-test are presented; *p*-values less than the 0.01 (the 99% confidence interval) are represented as "<0.01". Similar distribution for values between cohorts are highlighted green, while non-significant differences in distribution are highlighted orange.

Feature	Sub-Adm	Sub-Dep	Sub-Can	Adm-Dep	Adm-Can	Dep-Can
Edu Attainment	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Median Income	<0.01	<0.01	<0.01	<0.01	<0.01	**0.148**
Gini Coefficient	**0.049**	<0.01	<0.01	<0.01	<0.01	<0.01
Unemployment	<0.01	<0.01	<0.01	<0.01	**0.635**	<0.01
Median House Value	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Housing Occ %	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Housing Own %	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Population	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Pop Density	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Asian	<0.01	<0.01	<0.01	<0.01	<0.01	**0.262**
African American	<0.01	<0.01	<0.01	<0.01	**0.129**	<0.01
Other	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
White	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
HS GPA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Distance to MSU	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01

Comparing the community features for All Applicants in the noted application funnel pairs largely supports the initial assumption that the distribution of community features between the four different funnel classifications is different. The Submit versus Admit, Deposit, and Cancel are significantly different (*p*-value less than 0.01) when not considering the investigated community features. When considering the three funnel states for those invited to enroll at MSU (Admit, Deposit, and Cancel), three community features can be considered to have similar distributions. The median income distribution between Deposit and Cancel cohorts for all applicants is considered similar (*p*-value=0.148). In contrast, this distribution is significantly different for the Admit-Deposit (*p*-value < 0.01) and Admit-Cancel (*p*-value < 0.01) cohorts. The community feature representing the proportion of the community identifying as African American is similar for Admit-Cancel (*p*-value=0.129) while being significantly different for Admit-Deposit (*p*-value < 0.01) and Deposit-Cancel (*p*-value < 0.01). The distribution for the fraction of the community identifying as Asian is also similar between those depositing and cancelling (*p*-value=0.262) while significantly different (*p*-value < 0.01) for the five other funnel pairs. A similar trend is observed for the fraction of the community that is unemployed

(unemployment rate), where the Admit-Cancel distributions are similar (p-value=0.635) while the five other funnel status pairs are considered significantly different (p-value < 0.01).

Table 2. Comparison Between Funnel Status (Michigan Residents). The p-values for the Welsh's Two Sample t-test are presented; p-values less than the 0.01 (the 99% confidence interval) are represented as "<0.01". Similar distribution for values between cohorts are highlighted green, while non-significant differences in distribution are highlighted orange.

Feature	Sub-Adm	Sub-Dep	Sub-Can	Adm-Dep	Adm-Can	Dep-Can
Edu Attainment	<0.01	<0.01	<0.01	<0.01	**0.998**	<0.01
Median Income	<0.01	<0.01	<0.01	<0.01	**0.661**	<0.01
Gini Coefficient	**0.020**	<0.01	**0.474**	<0.01	**0.804**	<0.01
Unemployment	<0.01	<0.01	<0.01	<0.01	**0.768**	<0.01
Median House Value	<0.01	<0.01	<0.01	<0.01	**0.874**	<0.01
Housing Occ %	<0.01	<0.01	<0.01	<0.01	**0.340**	<0.01
Housing Own %	<0.01	<0.01	<0.01	<0.01	**0.209**	<0.01
Population	**0.019**	<0.01	**0.192**	**0.015**	**0.753**	**0.602**
Pop Density	<0.01	<0.01	<0.01	<0.01	**0.079**	**0.153**
Asian	<0.01	<0.01	<0.01	<0.01	**0.612**	**0.028**
African American	<0.01	<0.01	<0.01	<0.01	**0.256**	<0.01
Other	<0.01	<0.01	<0.01	<0.01	**0.019**	**0.123**
White	<0.01	<0.01	<0.01	<0.01	**0.532**	<0.01
HS GPA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Distance to MSU	<0.01	<0.01	**0.333**	<0.01	**0.339**	<0.01

Using a "these cohorts are dissimilar, but these two cohorts are similar" framework, it is proposed that those cancelling their deposit change their state back to Admit. Focusing on the noted socioeconomic features above, it is observed that educational attainment (fraction of the community with a bachelor's degree or more), Gini Coefficient (indication of the income inequality within a community with a value of zero indicating no income inequality and a value of one indicating a significant difference between income values), housing values (median housing unit value), median income, and unemployment rate distributions are similar between the Admit-Cancel cohorts. In contrast, the distributions of these features are significantly different for the Admit-Deposit and Deposit-Cancel cohorts. Because the distributions are different for the Admit-Deposit and Deposit-Cancel cohorts, the communities of these cohorts are viewed as different based on the noted features. The Admit-Cancel cohorts have similar feature distributions and, thus, are considered similar. Taken together, in-state applicants who cancel their deposits revert to a state of Admit.

When focusing on Michigan residents and comparing community features between the Submit and Admit, Deposit, and Cancel cohorts, the Gini Coefficient, distance to MSU, population size, and the housing occupancy rate deviated from the initial assumption. The Gini Coefficient distributions for the Submit-Admit cohort have a non-significant difference (p-value=0.020) and the Submit-Cancel cohort distributions are considered similar (p-value=0.474). The distance to MSU distributions for the Submit-Cancel cohort is also considered similar (p-value=0.333) while the Submit-Admit and Submit-Deposit cohorts are considered significantly different (both have p-values less than 0.01). The size of the applicant's community follows a similar trend where there is a significant distribution difference between the Submit-Deposit cohorts (p-value < 0.01), a non-significant difference between the Submit-Admit cohorts (p-value=0.019), and the population distributions between the Submit-Cancel cohorts is consider similar (p-value=0.192).

Continuing to focus on Michigan residents but comparing the community features between the Admit, Deposit, and Cancel cohorts, a pattern emerges. The distribution between the Admit and Cancel cohorts are considered similar (p-value greater than 0.10) for all community features except for population size (p-value=0.079), the fraction of the community composed of individuals identifying as a race not among the options (Race Other) in the American Consumer Survey (p-value=0.019), and high school GPA (p-value < 0.01).

Table 3. Comparison Between Funnel Status (non-Michigan Residents; out-of-state). The *p*-values for the Welsh's Two Sample t-test are presented; *p*-values less than the 0.01 (the 99% confidence interval) are represented as "<0.01". Similar distribution for values between cohorts are highlighted green, while non-significant differences in distribution are highlighted orange.

Feature	Sub-Adm	Sub-Dep	Sub-Can	Adm-Dep	Adm-Can	Dep-Can
Edu Attainment	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Median Income	<0.01	<0.01	<0.01	<0.01	**0.057**	<0.01
Gini Coefficient	**0.923**	<0.01	**0.084**	<0.01	**0.080**	**0.604**
Unemployment	<0.01	<0.01	<0.01	<0.01	**0.993**	<0.01
Median House Value	<0.01	<0.01	<0.01	<0.01	**0.032**	**0.454**
Housing Occ %	<0.01	<0.01	**0.016**	<0.01	<0.01	<0.01
Housing Own %	<0.01	<0.01	<0.01	<0.01	**0.823**	<0.01
Population	<0.01	<0.01	<0.01	<0.01	<0.01	**0.425**
Pop Density	<0.01	<0.01	<0.01	<0.01	<0.01	**0.320**
Asian	<0.01	<0.01	**0.023**	<0.01	<0.01	**0.287**
African American	<0.01	<0.01	<0.01	<0.01	**0.190**	<0.01
Other	<0.01	<0.01	<0.01	<0.01	**0.173**	<0.01
White	<0.01	<0.01	<0.01	<0.01	**0.983**	<0.01
HS GPA	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Distance to MSU	**0.025**	<0.01	<0.01	<0.01	<0.01	<0.01

Out-of-state applicants do not share the same feature similarities for Admit-Cancel cohorts. Instead, community features for out-of-state applicants that are similar occur between a combination of Admit-Cancel and Deposit-Cancel cohorts. Between Admit-Cancel cohorts, the educational attainment and median income features are significantly dissimilar (*p*-value < 0.01) and non-significant different (*p*-value=0.057), respectively.

Several similar trends are observed for out-of-state applicants that are seen for in-state applicants. The Gini Coefficient distributions between Submit-Admit applicants are similar (*p*-value=0.923), the Submit-Cancel cohorts have a non-significant difference (*p*-value=0.084), while the Submit-Deposit cohorts have significantly different distributions (*p*-value < 0.01) for the Gini Coefficient distributions.

The racial composition of a community for each of the cohorts appears to provide a separation between funnel cohort pairs. For in-state applicants (Table 2), the Admit-Cancel cohorts share value distributions (*p*-values greater than 0.01) for Asian, African American, Other, and White. Out-of-state applicants (Table 3) have different distributions

for the proportion of the community identifying as Asian for the Admit-Cancel cohorts but the distributions for the Deposit-Cancel cohorts are considered similar.

Community Median Income – High School GPA Relationship

Previously it was proposed that a community's median income can influence the amount of public education funding and the was likely a relationship between median income and high school GPA. Figure 10 presents the median income (using the zip code 2022 US Census ACS-5 data) for the applicants' residency zip code for In-State (green) and Out-of-State (purple). They represent the median income distribution for applicants classified in the four application funnels. A majority of in-state applicants are from communities with median incomes less than $100k. This trend is only presented for out-of-state applicants who are not admitted to MSU, residing in communities with a median income of less than $75k. A majority of out-of-state applicants classified as Admit, Deposit, and Cancel reside in communities with a median income of approximately $100k.

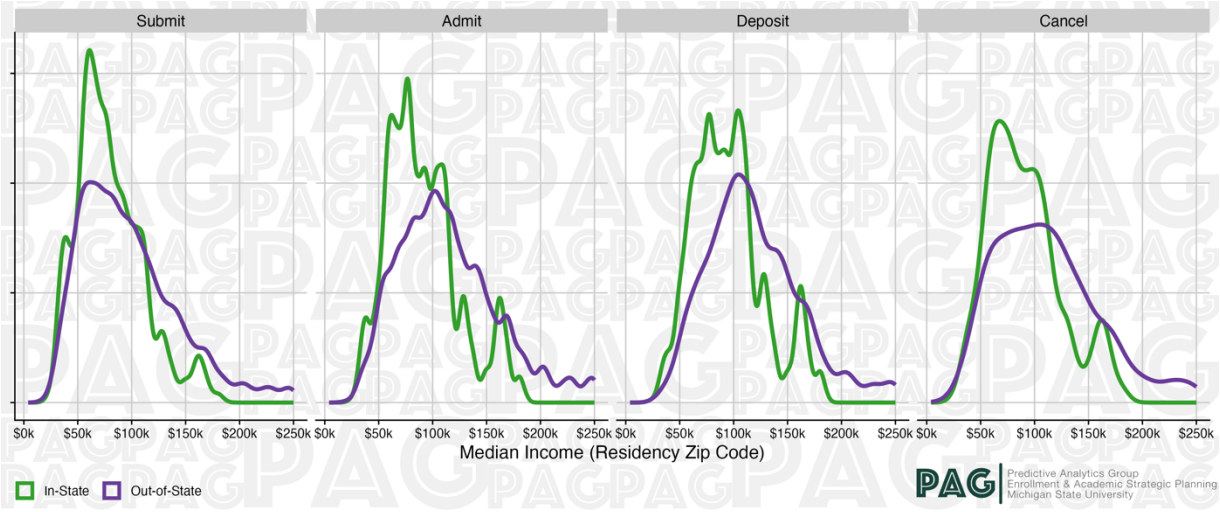

Figure 10. Community Median Income Distributions per Funnel Status.

As we discussed, one interpretation of these results is that most applicants (in-state and out-of-state) not accepted (those within the Submit classification) could be failed by the public schools they attend due to limited resources (funds). Thus, they might have received different educational opportunities than their peers from school districts with more resources. Remember, median income is one feature and aspect of a community's tax base, and perceived elements of a community (zip code) beyond median income should not be made about or attributed to applicants based on these plots.

Most of those within the Submit classification reside within communities with lower median incomes (in-state and out-of-state) than their peers. The distribution appears to peak at around $60k for in-state and out-of-state applicants. The median income distributions for in-state Admits reside in communities with a median income range between ~$55k to $70k while Admits from out-of-state have a peak median income of approximately $100k. There is a difference in the distribution of median incomes for in-state and out-of-state applicants after their peaks (Admit, Deposit, and Cancel) as a greater proportion of out-of-state applicants reside in communities with higher median incomes than in-state applicants. A noticeable number of Admit, Deposit, and Cancel in-state applicants reside in zip codes with a median income of approximately $160k. As a whole, in-state Admit, Deposit, and Cancel applicants have analogous median income distributions; a majority of these cohorts residing in communities with median incomes between $60k-$105k. The same can be claimed for out-of-state applicants but simply comparing the distribution by eye and claiming the distributions have similar features and shape is different than performing Welsh's Two Sample t-tests.

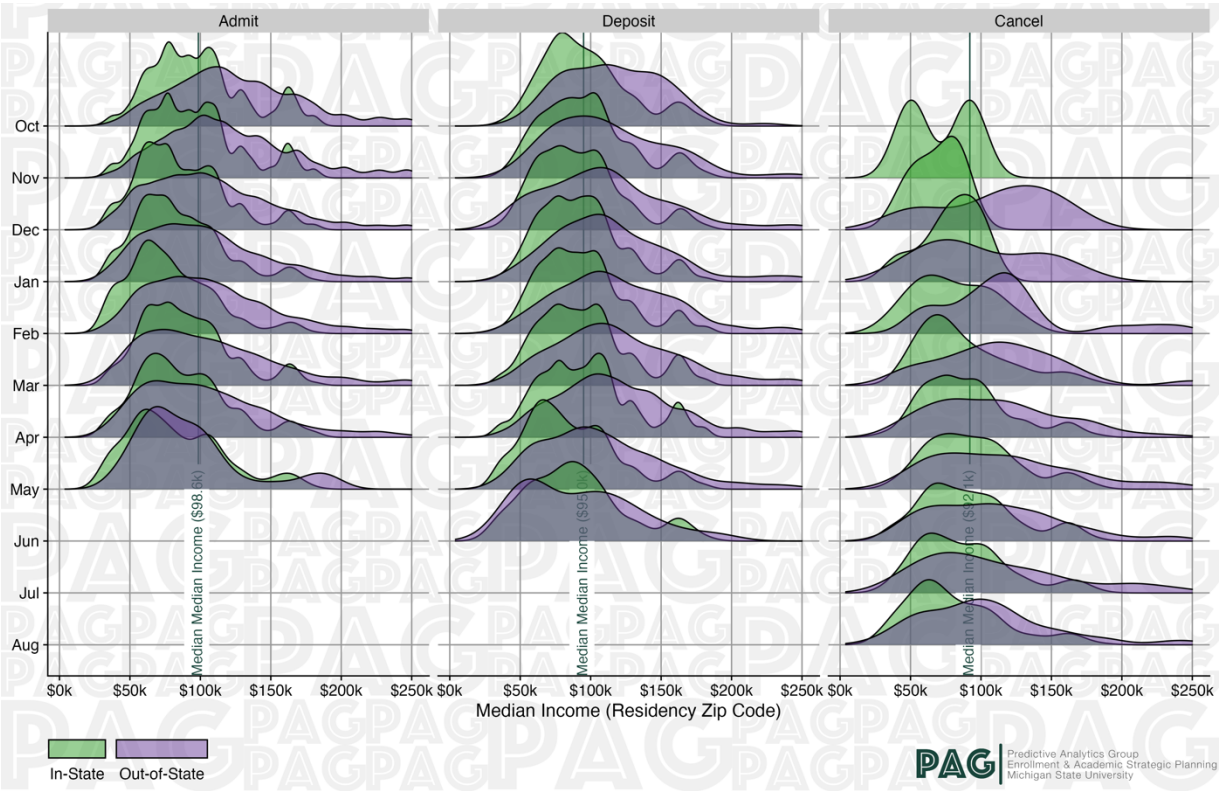

Figure 11. Community Median Income Distributions per Funnel State per Month.

Examining the median income of the applicants' communities based on the month the applicant is assigned to a funnel state provides an interesting comparison between the in-state and out-of-state applicants. The density plots in Figure 11 demonstrate that the shape of the distribution is influenced by the number of applicants in each residency category and month. Thus, it is expected that out-of-state distributions would be smoother than in-state distributions because there are few out-of-state applicants in each month-funnel status combination. The smoothing of the in-state distributions moving from Admit to Cancel demonstrates the impact the number of applicants has on the variability of the density plot's surface. The median income of out-state Admits gradually shifts from approximately $100k for those admitted in October to a peak median income of approximately $65k for those admitted in March, April, and May. A similar trend is noted for in-state applicants, though it is more of a reduction in the proportion of applicants from communities with median incomes of $100k or more. The median income for each funnel status decreases from $98.6k for Admits to $95.0k for Deposits to $92.1k for Cancels.

There are general trends observed within the high school GPAs for each of the funnel states, with generalized trends based on the month of the funnel action. The individual month comparisons for each funnel state are discernable. Overall, the GPAs for those in each funnel state are significantly different; see Tables 1, 2, and 3.

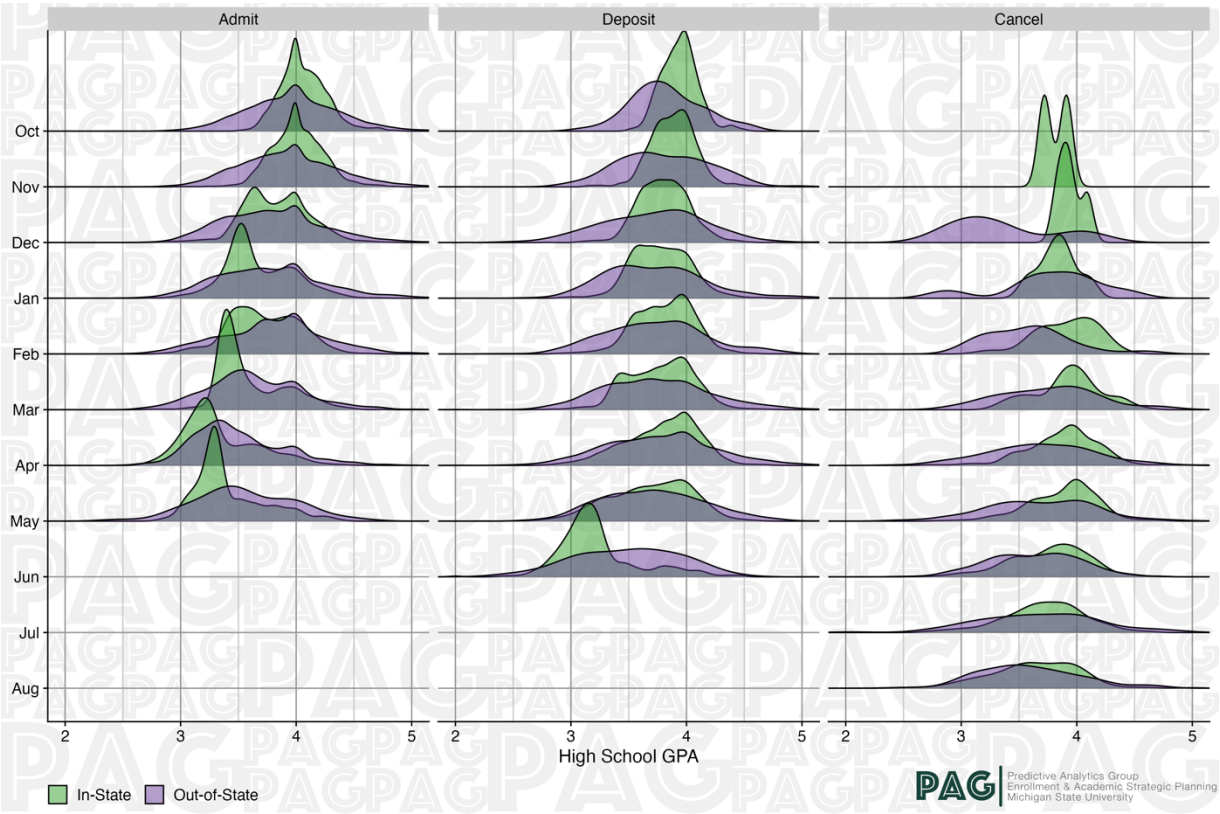

Figure 12. High School GPA Distributions per Funnel Status per Month.

The high school GPA for all admitted applicants (Admit; in-state and out-of-state) follows the expected trend of those with a higher GPA being admitted to MSU earlier in the admissions cycle; see Figure 12. A majority of those depositing from October to May have high school GPAs of 3.5 or greater until the month of June, when many of the applicants with GPAs less than 3.5 deposit. Caution must be taken as the density peaks are not proportional to the total number of samples but based on the size of the sample for the specific residency and month. Based on Figures 4 and 5, those admitted in April and May deposit in April, May, and June, and thus a majority of those depositing in June were admitted in the recent prior months. Most of the in-state applicants who cancel their deposits between February and June have a GPA of approximately 4.0 while those cancelling earlier than February and in June or later have GPAs of less than 4.0.

The GPAs of out-of-state Admits follow a similar trend as in-state Admits and typically have a high school GPA between 3.0 and 4.0. The relatively flat nature of the GPA distributions observed for cancellations are likely to be due to the wide GPA distribution of out-of-state applicants – overall – who cancel their deposits.

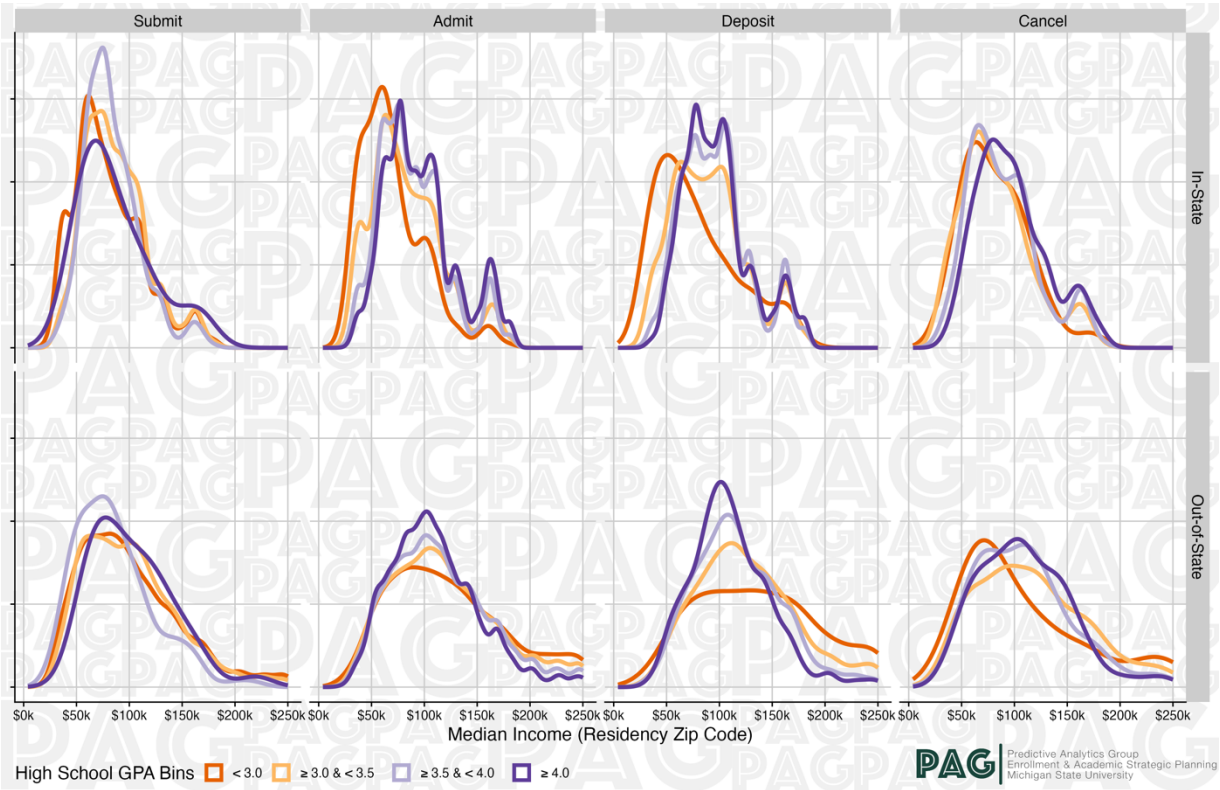

Figure 13. Community Median Income Distributions per Funnel Status and Residency. The distributions are separated based on high school GPA of the applicants in each funnel state.

The trends for the relationship between median income of the community and the applicant's high school GPA bin (less than 3.0, greater than or equal to 3.0 and less than 3.5, greater than or equal to 3.5 and less than 4.0, and greater than 4.0) and residency (in-state or out-of-state) are presented in Figure 13 and expands the information presented in Figure 10. Applicants who are not admitted to MSU have a range of high school GPAs but a majority of them reside in communities where the median income is less than $100k per year. For in-state applicants (Michigan residents), the high school GPA trends for those in the Admit and Deposit categories show a divergence regarding the overlap of densities for applicants with a high school GPA less than 3.0 as a majority of them reside in communities with a median income of approximately $50k. Again, in-state applicants with a high school GPA greater than or equal to 3.0 (within the Admit and Deposit classifications) reside in communities with median incomes ranging from $75k to $100k. The communities of in-state cancellations have similar median income distributions with those applicants with a GPA of 3.0 or greater residing in communities with slightly greater median incomes than those with a high school GPA less than 3.0. When considering out-of-state applicants, overall, each funnel state indicates that regardless of high school GPA, the applicants reside in communities with similar median income distributions. Closer inspection of the high school GPA distributions for the Deposit category of out-of-state applicants shows that for those with lower high school GPAs, a greater proportion of this cohort resides in wealthier communities (median incomes greater than $150k) compared to the other GPA bins. This does not mean that more out-of-state applicants with lower high school GPAs are attending MSU, only that compared to the subcohorts within the out-of-state depositor's cohort, those with a high school GPA less than 3.0, a larger proportion of this subcohort resides in a community with a median income greater than $150k with a sizable portion residing in communities with an median income less than $75k. This specific trend is also observed for out-of-state depositors with a high school GPA greater than 3.0 and less than or equal to 3.5. Out-of-state applicants who cancel their deposit often reside in communities with median incomes of less than $100k.

Distance to MSU

Due to MSU's central location in Michigan's lower peninsula, a significant portion of the state's population resides within 100 miles of MSU. The relatively short distance (less than 100 miles and thus less than a 90-minute drive) from several large population centers results in MSU receiving applications from a large cross section of the state's population.

Table 4. Distance to MSU for MSU Applicants.

Distance	Submit	Admit	Deposit	Cancel
< 25	3.1%	1.8%	6.6%	3.7%
≥ 25 & < 50	6.3%	4.9%	11.1%	8.6%
≥ 50 & < 75	24.4% (33.8%)	20.8% (27.5%)	44.6% (62.3%)	34.3% (46.6%)
≥ 75 & < 100	9.6% (43.4%)	7.1% (34.6%)	12.7% (75.0%)	9.9% (56.5%)
≥ 100 & < 150	2.5%	2.2%	2.9%	2.1%
≥ 150 & < 200	14.7%	19.9%	7.5%	11.1%
≥ 200 & < 250	4.1%	5.2%	1.7%	3.1%
≥ 250	35.3%	38.0%	12.9%	27.0%

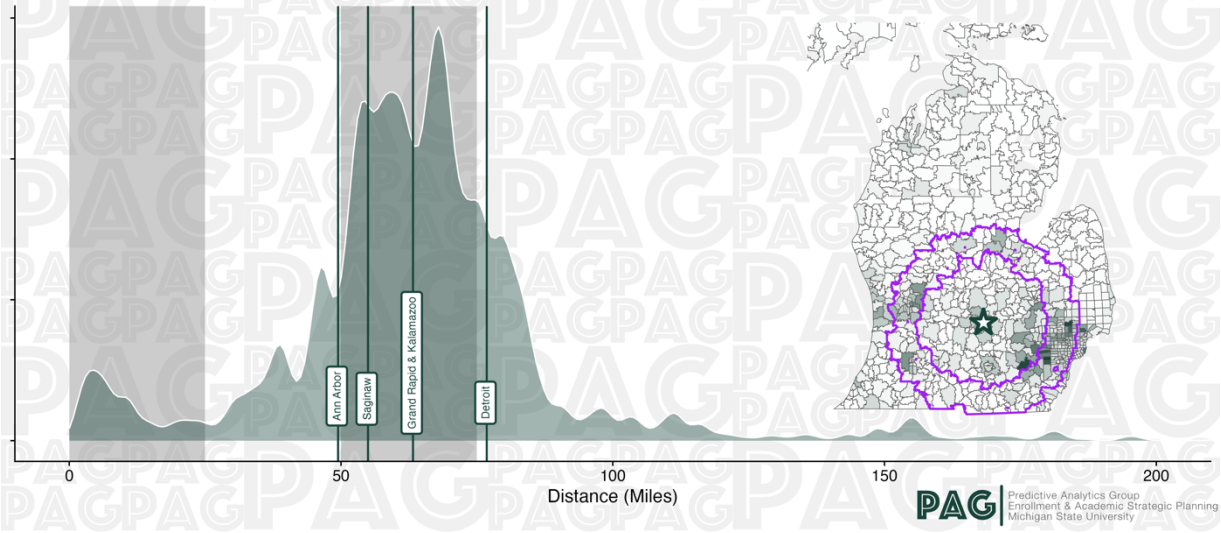

Figure 14. Distribution of the Distance Between Applicant Residency and MSU. The grey shaded regions behind the density plot represent distances 0-25 and 50-75 miles from MSU. The inset map illustrates the number of applications received from each zip code by shading the zip code green; the more applications the darker the green. The communities within the purple rings are between 50 and 75 miles from MSU. MSU is denoted by the green and white star.

The density plot (Figure 14) illustrates the applicant population density of Michigan's lower peninsula as a function of the applicant's distance from MSU. The zip codes of the inset map are shaded based on the number of applications obtained for FS22, FS23, and FS24 incoming first-year applicants. The zip codes contained within the purple boundaries indicate zip codes 50 to 75 miles from MSU. This band incorporates multiple metropolitan

statistical areas that collectively account for approximately 63% of Michigan's population.[7] Given MSU's central location on the lower peninsula and the population density on the lower peninsula, the distribution of MSU applicants is significantly different from that of MSU applicants who decide to attend the GVSU, UoM, and WSU; see Figure 15.

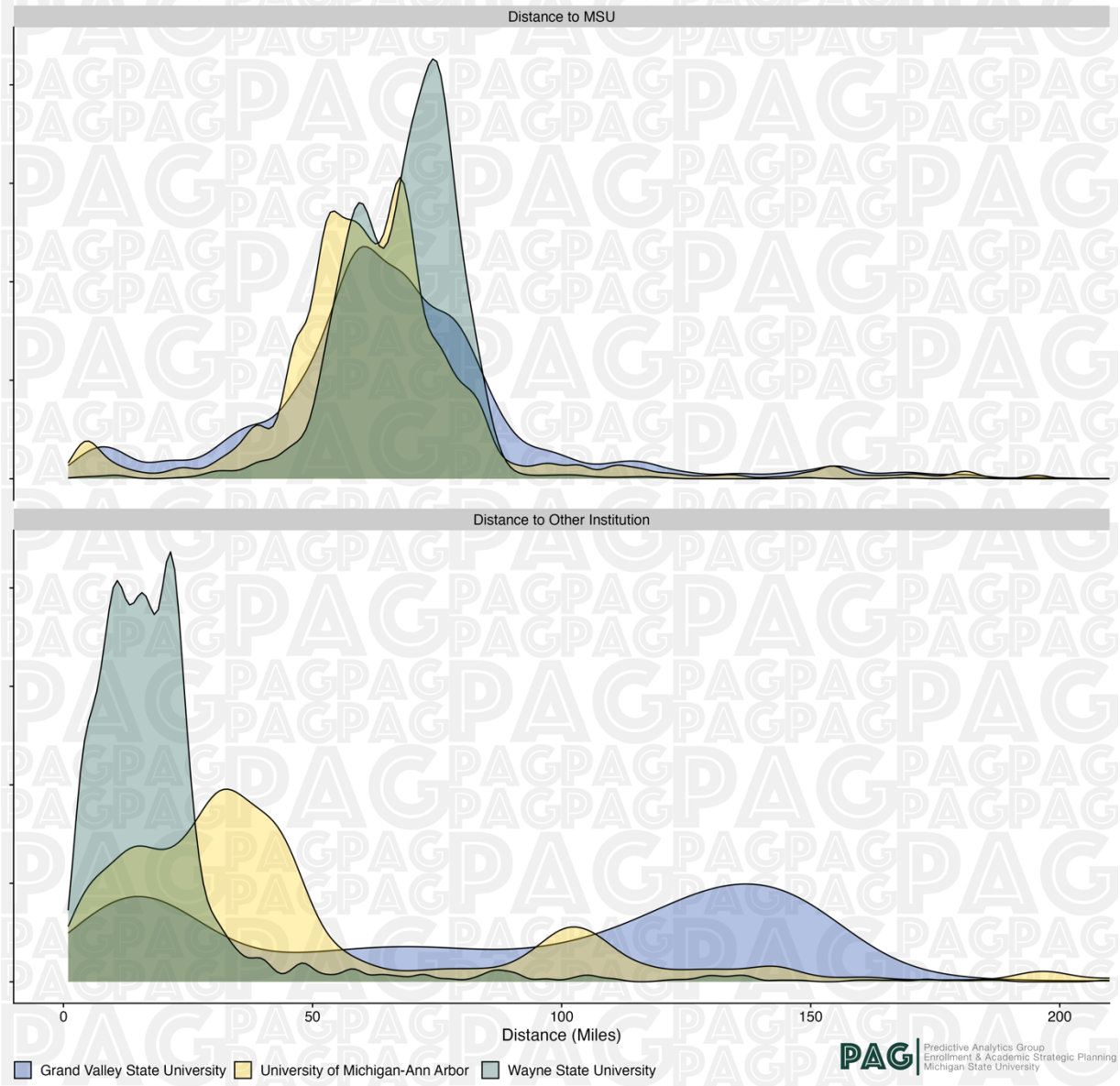

Figure 15. Distribution of the Distance Between Applicant Residency and Institution. The top density plot (Distance of MSU) is the distance between the applicant's residence and MSU. The bottom density plot (Distance to Other Institution) is the distance between the applicant's residence and their selected institution. Density plots are shaded based on the applicant's selected institution.

[7] This includes the Detroit-Warren-Dearborn, and Grand Rapids-Wyoming-Kentwood MSAs and the Kalamazoo-Battle Creek-Portage and Saginaw-Midland-Bay City CSAs, as defined by the U.S. Office of Management and the Budget.

Selection of Another Institution

While MSU knows the other institution that applicants select when not enrolling at MSU,[8] this section initiates the exploration of socioeconomic aspects of an MSU applicant who decides to attend a different institution. By understanding the external factors – not associated with MSU – of why an applicant might select another institution, MSU can explore why applicants choose to enroll at MSU. Through these analyses, MSU can rationally design and tailor solutions to attract those considering MSU but ultimately enrolling at another institution.

The cost differences between MSU and the selected other institution, the difference in distance between the applicant's residency and MSU and the chosen other institution, and the income and educational attainment of the applicant's community are considered. As noted earlier in this document, these aspects of an applicant's community – especially for Michigan residents – could significantly impact whether and where to attend a higher education institution.

Michigan residents attending another four-year Michigan institution (public or private and other than UoM and MSU) reside in communities with lower educational attainment (median 38%) than Michigan residents attending out-of-state institutions (51%). The lower educational attainment (percentage of the community with a bachelor's degree or more) follows the trend of a lower median income. An exception to this trend is Michigan residents attending Kalamazoo College with a median educational attainment of 49% and median median income of $78.6k.

Michigan residents who decide to attend another in-state institution pay a median of $3,836 more in total costs but live closer to home (~31 miles closer than MSU). The applicants also reside in communities with the lowest median median income ($83,286) of those reporting another institution of attendance. Out-of-state residents who decide to attend an institution in their home state have a median cost savings of $25,414 for public institutions and a median cost savings of $11,648 for those attending a private institution (in or out of their state of residency). Michigan residents attending a private institution pay a median premium of $7,232 over MSU's cost ($30,990; 2022 College Scorecard data). The median median income ($87,143) for the communities of Michigan residents attending a private institution is considerably lower than the median median income ($103,278) of the communities for out-of-state applicants attending a private institution. The cost difference for out-of-state applicants attending another public institution in Michigan is skewed due

[8] Those applying to MSU and deciding to attend another institution can allow the National Student Clearinghouse to inform MSU of their selected institution. Applicants have the option of opting out of this reporting.

to the large number (320 of 628; ~51%) selecting the UoM (out-of-state cost: $80,375). MSU's out-of-state cost is $57,576 compared to the out-of-state costs of WMU's ($36,758) and GVSU's ($35,450).[9] While the median cost difference for out-of-state applicants attending another public institution in Michigan is $22,799, the average cost difference compared to MSU is $1,612±22,503, demonstrating the bimodal nature of the distribution.

Table 5. Demographic and Financial Information for Those Apply to but Not Enrolling at MSU.

		Count	HS GPA	Median Income*	Educational Attainment	Cost Difference	Distance Difference†
In-State	MI Inst	15,712	3.97	$83,286	38.3%	$3,836	-31
	Out-of-State Inst	2,833	3.92	$101,250	51.2%	$25,150	260
	Private‡	4,397	3.91	$87,143	41.9%	$7,232	65
Out-of-State	In-State Inst	13,866	3.90	$95,093	45.5%	-$25,414	-242
	MI Inst	628	4.00	$100,692	46.0%	$22,799§	-2
	Out-of-State Inst	14,797	3.82	$122,691	59.4%	-$764	-5
	Private‡	8,343	3.81	$103,278	49.9%	-$11,648	-157

All values, other than Count, are the median value. *The reported Median Income for the noted cohorts is the "median median" income, as the presented value is the median income value from a collection of median income values. †The reported Distance Difference for out-of-state applicants attending Michigan institutions (MI Inst) and out-of-state Institutions is small (-2 and -5, respectively) because, overall, the median distance between MSU and the selected institution is equivalent; the average distance is -17±541 miles. ‡Private institutions were not designated as in-state or out-of-state because they traditionally charge the same rate for in-state and out-of-state enrollment. §MSU's out-of-state cost is $57,576 compared to WMU's ($36,758) and GVSU's ($35,450). While the median cost difference for out-of-state applicants attending another public institution in Michigan is $22,799, the average cost difference compared to MSU is $1,612±22,503, demonstrating the bimodal nature of the distribution.

Michigan residents, when not selecting MSU, attend UoM (*n*=5,657), GVSU (*n*=1,979), and Wayne State University (WSU; *n*=1,427). The distribution of the distances (between the applicant's residency and the selected campus) is unique for each institution. WSU primarily draws students from the Detroit region, UoM draws students from within 50 (Detroit region) and 100 miles (Grand Rapids and Saginaw Valley regions) of Ann Arbor, and GVSU remarkably draws MSU applicants within 25 miles (Grand Rapids region) and between 100 and 150 miles (Detroit and Saginaw Valley regions) of campus. Of the

[9] GVSU's and WMU's out-of-state cost of attendance is approximately the same as their in-state cost of attendance.

applicants who applied to MSU, those attending WSU predominantly reside in the Detroit region; see Figure 15.

Cancel Date and Other Institutions

We know that approximately half of cancellations happen two-and-a-half months before the first day of the fall semester; see Figure 2. While UoM accounts for a majority of the reported other institutions for those cancelling their deposits, the top five institutions MSU applicants decide to attend – regardless of cancellation status – for FS22 and FS23 are UoM (*n*=5,988), University of Indiana – Bloomington (*n*=2,070), Grand Valley State University (GVSU; *n*=2,057), University of Illinois – Urbana-Champaign (*n*=1,973), and Wayne State University (WSU; *n*=1,451). When considering only those that cancelled their deposit (again, for FS22 and FS23; see Figure 6) the top six[10] institutions are UoM (*n*=179), GVSU (*n*=70), Oakland University (*n*=52), WSU; *n*=52), University of Indiana – Bloomington (*n*=39), and Western Michigan University (WMU; *n*=39). Figure 16 illustrates the cancellation trends and where those cancelling enroll. Care should be taken when drawing conclusions from the relationship between cancellation date and the reported other institution. Since the cancellation date is when the applicant cancels their deposit with MSU, it may not correctly indicate when the applicant decided to attend (deposit) at another institution. This is supported by the distinct bands in June that are the result of MSU's Office of Admissions contacting applicants to verify their intention to attend MSU.

[10] The tie between the University of Indiana – Bloomington and WMU resulted in the reporting of six institutions.

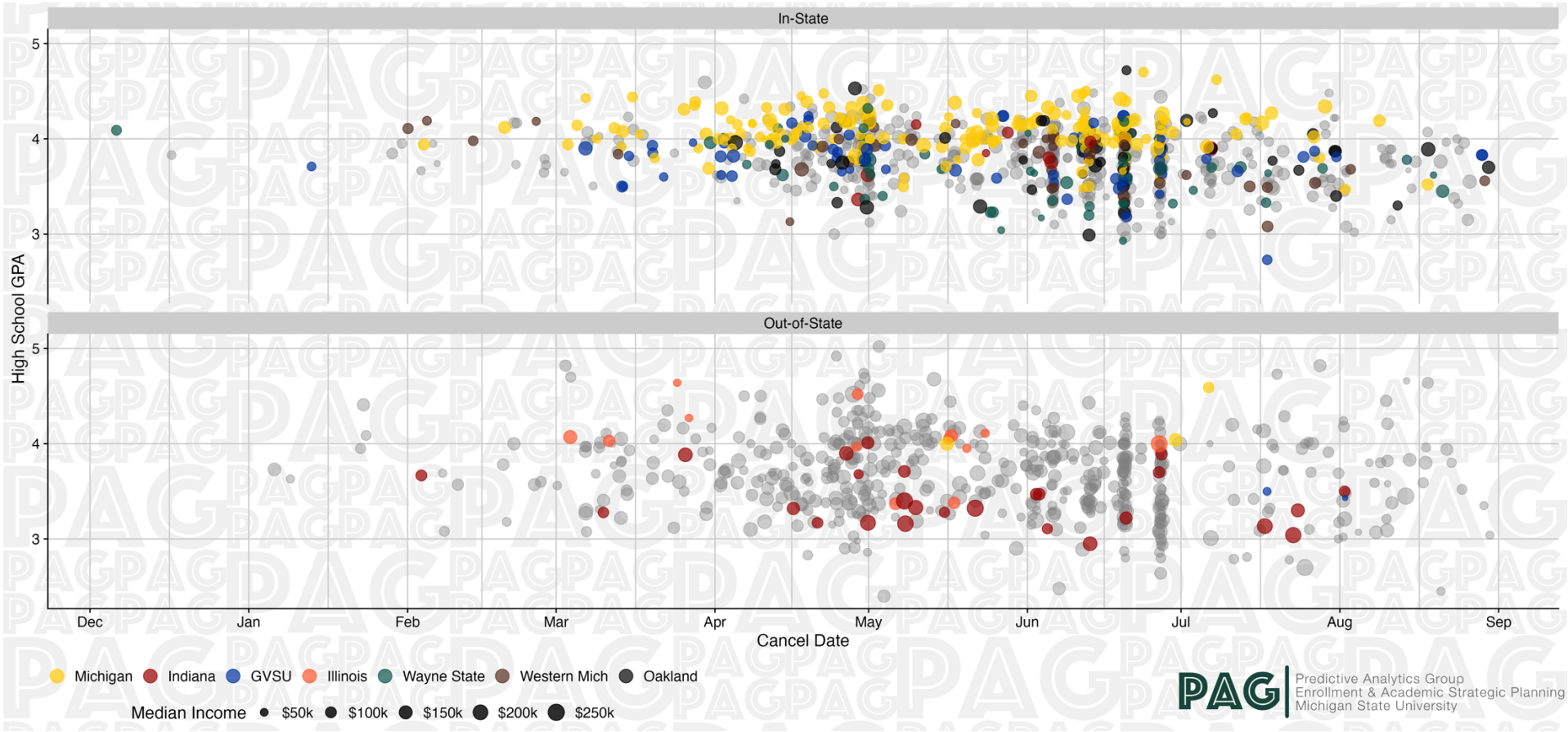

Figure 16. Cancelling Applicants Over Time. Top institutions highlighted for FS22 and FS23.

Conclusion

The presented work provides a holistic overview of the applicants as they progress through the admissions funnel, emphasizing those depositing and cancelling. The study is a starting point for future questions and is seen as a retrospective of the past three incoming classes. Combining applicant data from Slate and the National Student Clearinghouse with American Consumer Survey data from the US Census, it was possible to explore the potential impact the applicant's community might have on their decisions and ability to attend MSU. Viewing in a temporal framework, understanding when applicants are admitted and when they deposit, combined with their high school GPA and the median income of their community, enables a different perspective. Including cancellation dates, the institutions selected instead of MSU, their cost of attendance, and the applicant's distance to the selected institutions provide deeper insight into the role of multiple external factors likely influencing their decisions.

This report prepares us for future studies that delve deeper into the presented topics and related questions. The data used in this study augments and expands what is traditionally considered applicant data. Incorporating new data allowed the discovery of new ideas and the ability to consider combining multiple independent features. Hopefully, the information presented will be a starting point for new discussions about old topics.

Materials & Methods

Datasets

The Slate application data for fall semester applications entering during the 2022, 2023, and 2024 fall semesters (FS22, FS23, and FS24, respectively) and the United States Census' American Consumer Survey (ACS) five-year average dataset for 2022 were combined to form the data used in the analyses presented herein. The two datasets were merged using the applicant's residency zip code. Other institution data was obtained from the FS22 and FS23 National Student Clearinghouse dataset.

Because applicant values are extracted and derived from Slate data, the values presented within this study will follow a similar trend to those presented by MSU's Institutional Research (IR) office and available within IPEDS datasets. The slight (small, miniscule) value differences do not significantly impact the conclusions. The exact number of applicants reported herein likely differs from other reported values by IPEDS or MSU. We

acknowledge these potential differences but do not believe they impact the reported outcomes or conclusions.

Residency

Only domestic, United States of America (USA) citizens are considered in the funnel status comparison when considering community features. A domestic applicant was determined by excluding applicants whose residency, high school location, and residency type were "international". Domestic applicants were classified as "In-State" if they resided in Michigan (MI), while those indicating they resided in the "United States of America", but not the state of Michigan, were classified as "Out-of-State" (those residing the US territories were classified as "Out-of-State". Those residing in a country other than the "United States", were classified as "International". This study only considers applicants that reside within the United States of America and its territories. Excluding "International" applicants from this analysis is due to the difficulty obtaining socioeconomic data for the regions they reside, the inability to standardize socioeconomic data for international applicants, and the overwhelming influence the difficulties obtaining a Visa has on the likelihood of an International applicant to make and cancel their deposit.

Submit, Admit, Deposit, & Cancellation

Four different application funnel statuses are defined, and each status builds on the previous status. Each subsequent status inherently includes the previous status. An applicant cannot be classified as a later status without achieving the previous status(es).

- Applicant: One that submits an application to MSU for consideration for admission. An applicant can occupy any of the following funnel states but can only occupy a single state at any point in time.
- Submit: Application submitted but not admitted to MSU.
- Admit: Application submitted and invited to attend MSU.
- Deposit: Applicant indicates a desire to enroll at MSU by making a deposit.
- Cancel: After making a deposit, the applicant decides not to enroll at MSU and cancels their deposit.

Applications with an "Admit" date were considered accepted to MSU, those with "Admit" and "Deposit" dates were classified as making a deposit to attend MSU, and those with "Admit", "Deposit", and "Cancel" dates are classified as cancel.

High School Grade Point Average (GPA)

The Applicant's high school grade point average (GPA) is obtained from their Slate applications. The high school GPA values are not scaled, but values greater than 5.0 are converted to 5.0.

Financial Aid Data

Data related to financial aid, specifically the Free Application for Federal Student Aid (FAFSA), is not included in this analysis for two reasons. The first reason is that not every applicant completes a FAFSA form, thus, only a portion of the applicants would have their FAFSA information sent to MSU by the Department of Education. The second reason is that the Office of Financial Aid has not historically retained FAFSA information for applicants who decide not to attend MSU, regardless of if they make a deposit. These two reasons make the inclusion of FAFSA information in this analysis inconsistent. Moving forward, it would be interesting to include FAFSA data to understand better an applicant's and all applicants' decisions through a financial lens.

United States Census' American Consumer Survey

The United States Census' American Consumer Survey (ACS) five-year averaged values provide information on the demographics of the zip code. Specifically, the zip code's population, population density (people per km^2), race composition, median income (maximum value of $250,000 with values of $250,001 indicating a zip code's median income over $250,00), Gini coefficient, percent employment, housing occupancy, and the population with at least a bachelor's degree.

The unemployment fraction is defined as the number of households (with and without an occupant under 18 years of age) with at least one unemployed adult divided by the total number of households in the zip code.

College Scorecard via IPEDS

The cost of attendance includes the university-provided cost of books, room & board, other expenses, and other family expenses obtained from the 2022 College Scorecard dataset derived from IPEDS datasets. Tuition for the institutions is based on the values provided in the 2022 College Scorecard dataset derived from IPEDS datasets. The tuition of private institutions is based on full-time equivalents and not the listed tuition amount, while in-state and out-of-state tuition values are used for public institutions.

National Student Clearinghouse

Using the Fall 2022 (FS22) and Fall 2023 (FS23) National Student Clearinghouse data, applicants and their institution of choice were combined with the selected institutions corresponding IPEDS data.

Cohort Similarity

The similarity in the features' distribution was analyzed using Welch's Two Sample t-test and Cohen's d to account for effect size at the 99% confidence interval. Thus, when comparing two distributions, those with *p*-values equal to or less than 0.01 were considered significantly different. The corresponding Cohen's d value (used during analysis and not reported) indicates the impact of the distribution size and the size of the values. When comparing two distributions, *p*-values equal to or less than 0.01 were considered independent, thus they are not related.

Applications

The analysis presented in this document was performed using R (version 4.4.1) on macOS. Numerous packages, including but not limited to the tidyverse, dplyr, ggplot2, lubridate, cowplot, ggridges, and theHUB, were used to perform the analyses.

About the Predictive Analytics Group (PAG)

The Predictive Analytics Group (PAG) was formed in the spring of 2022. It is a small research and development (R&D) group specializing in predictive modelling, analytics, and economics. PAG works at the intersection of potential and current student data to explore and provide insights into potential students' behaviors and outcomes. We provide an independent and unique perspective on student-centric inquiries. Since PAG's inception, its focus has been on predicting applicant outcomes. Still, during PAG's short existence, PAG's portfolio is wide scoping and includes, but is not limited to, predictive modelling related to applicant actions (depositing and cancelling), providing insights to questions from the Board of Trustees, the Offices of Admissions and Financial Aid, individual colleges, proposing novel financial aid disbursement formulas, and reproducible analyses of frequently updated historical data.

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Artificial Intelligence Statement

This document's grammar, syntax, and readability were assessed and modified using Grammarly.