The Case of Israel: Budgets, Matriculation Exams, and the Ethnic Divide

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Abstract

In the domain of social justice, ever-diversifying, modern societies work to expand and improve their systems to accommodate multifarious citizen bases; failure to do so results in discrimination and marginalization that affects the success of minority populations. With specific regard to education systems in Israel, standardized testing presents a cavernous achievement gap between the dominant Jewish and periphery Arab student populaces. This paper assesses one of the factors that contributes to this discrepancy in test scores: budget allocation. Specifically, it will evaluate the relationship between test scores and budget in Israel proper, while controlling for Arab and Jewish school systems. Ultimately, data from the years 2008 to 2018 demonstrate a positive relationship between budgets and test scores, with clear variation between demographic categories and internal versus external budget measurements. As a result of this discovery, this thesis research confirms and challenges previous findings within educational literature, identifies significant implications as byproducts of this variable relationship, and proposes future policy adjustments and research expansion.

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Introduction

In the contemporary global sphere, the parameters and demands of the *nation-state* influence many – if not all – structural components within society. The immense power of nationalism to unite masses of otherwise-estranged citizens represents only one side of a double-edged sword; alternatively, the nation-state tends to rely heavily on hegemonic mechanisms in order to create a widely relatable national narrative, culture, value system, or even ethnic characterization. Thus, while the nation-state fortifies one dominant identity for the sake of nationalist might, it also marginalizes those ethnic, racial, cultural, linguistic, religious, or sexual identities residing outside of the standard. Intuitively, inhabitants who function as a societal "other" or who evade expectations of "normal" society are referred to as "minorities." Even though this term refers to a level of "inferiority" based on population proportion in society, the minority experience also correlates with a role within structures of power. Specifically, with regard to ethnic minorities, members experience reduced, or otherwise-altered, benefits and allowances compared to a dominant counterpart. As a result, in the realm of social justice, modern societies prioritize equity and strive to reject hegemonic forces and improve their systems to accommodate dynamic citizen bases. Within 21st century education, many societies seemingly try to guide the school system away from dominant ethnic hegemony, whether it be through financial resources, teacher training, or tailored curriculum. According to modern interpretation, negligence in this respect creates a discriminatory phenomenon.

In the case of Israel, as a result of the migration of Jews to Palestine at the turn of the 20th century and the formation of a nation-state, Jewish population, values, priorities, culture, language, and national sentiment dominate state action. Educationally, power imbalances manifest in the discrepancy of standardized test scores across ethnic divides. Though the

numbers continue to fluctuate depending on which religious group, municipality, or ethnicity is under scrutiny, inequity is the most persistent pattern. This paper evaluates one of the factors possibly contributing to this discrepancy in test scores: budget allocation. Specifically, it will evaluate the relationship between test scores and budget, while controlling for Arab and Jewish school systems.

Background

The ethnic divide in modern Israel began long before the formation of the state and has continued without exception through the country's short history. From Arab Palestine to Jewish Israel, immigration, war, and the ebbs and flow of power led to a transition in majority population, ultimately assigning the long-time Arab residents to stark ethnic minority status. In modern day, the Arab minority is subject to the goals, processes, and whims of an ethnonationalist Jewish state. Following the War of 1948, approximately 700,000 Arabs fled Israel, either voluntarily or at the hand of Jewish forces (Morris, 2007). Consequently, the Arab population, which once constituted the majority of Palestine's inhabitants, is now only 20 percent of Israel's population (Abu-Saad, 2003). Following such a tense history, according to Alexander (2019), there are currently more than 50 laws discriminating against the remaining Arab Israelis (p. 3). Among the many government-regulated systems within Israel, discriminatory policies have taken root in education, an institution with the power to control access to academia, availability of prestigious employment opportunities, and upward social, cultural, and economic mobility. By evaluating Israel's education system, budgets, and tests, this

research aims to uncover existing achievement gaps, resource inequality, or discriminatory behavior regarding Arab and Jewish children in Israel proper.[1]

Education in Israel

Ottoman Rule and the New Jewish Yishuv

Prior to the involvement of Western powers in the land of Palestine, the Ottoman Empire ruled the territory with a fairly hands-off approach, largely ignoring the Arabs living there. After a temporary change of power to the Egyptians in 1831, resources, access, and living conditions in Palestine improved marginally, though not enough by the time the empire was in decline. According to Shapira (2012), Palestine at the beginning of the 19th century was a remote place suffering from lack of governance, tribal clashes, and crime. However, in 1840, upon returning to Turkish rule, Ottoman powers granted greater rights, educational access, health resources, and travel options to Muslims and non-Muslims alike in Palestine (Bickerton & Klausner, 2018; Shapira, 2012). By the late 19th century, Ottoman rule had established some semblance of a French-based school system, comprised of public and private religious schools; however, there was extremely low attendance as there were no high schools and only 34% of male and 12% of female elementary-aged children attended (Abu-Saad & Champagne, 2006). Additionally, by the turn of the century, the Ottoman Empire was subtly waning, leaving many of the local Arab communities to fend mostly for themselves (Shapira, 2012). As a result, though education existed in Palestine long before the arrival of Jewish Zionists, lack of stable authority halted major progress and development. In Palestine, the people were not united, their structures were

[1] For this paper, "Israel proper" refers to Israel according to the pre-1967 borders, which excludes the West Bank and the Gaza Strip.

not under a system of standardization, and their access to external resources was virtually non-existent.

In contrast, Israel's Hebrew education system has roots back in history as far as the late 1800s, shortly after the official launching of the Zionist movement by Theodor Herzl. The first waves of settlers moving to, what was then, Palestine constituted an entity called, "the New Jewish Yishuv" and was responsible for establishing much of early Jewish culture in the region. While few resources were available to early migrants, the Jewish communities prioritized the development of a common tongue, culture, and story, a process widely dependent on nurturing education. In this early period of Zionist immigration to Palestine, Jewish settlers established a system of private schools funded by individuals or companies (Molcho, 2010). The Zionist Organization funded early Jewish education in the region with Hebrew as the primary language of instruction (Elboim-Dror, 2000, p. 30). As Hebrew education continued to modernize under philanthropic support, early schools focused on building a standardized national language, teaching the next generation of teachers to continue inter-system independence, and balancing traditionalist/religious education against enlightened and/or Zionist curricula (Raichel & Tadmor-Shimony, 2014). While the privatized nature of these early schools did not show much resemblance to centralized, modern Israeli education, the New Jewish Yishuv's scheme was, in fact, the predecessor for the entire contemporary institution. Early decision makers created the direction and specifications for all Hebrew education, language, and culture to come.

The British Mandate

Hebrew Education. During the British Mandate, while European powers sought to coordinate all systems of governance and regulation in Palestine, the Jewish population resisted outside influence to preserve their agency and autonomy. Essentially, early Hebrew education

aimed solely to continue the spread of Zionism and nation-building by integrating Jewish holidays into the calendar, teaching and standardizing Hebrew, and seeking Zionist teachers – the British would only interfere with these goals. The official wording of the mandate asserted, "'The right of each community to maintain its own schools for the education of its own members in its own language ... shall not be denied or impaired," and, therefore, the Jewish education system remained private at the sacrifice of British financial aid (Elboim-Dror, 2000, p. 30). The independently regulated systems divided Hebrew education into Orthodox, traditional schools, organization-funded, modern schools, and Zionist public schools; further subdivisions in the system constituted religious, Labour, and Zionist affiliations (Elboim-Dror, 2000, p. 30). The Zionist federation continued to independently organize education up until 1933, when power shifted to the Department of Education at the National Committee of the Yishuv (Dror, 2007, p. 79). Up through the beginning of the state, while surrounded by prying European influences, the New Jewish Yishuv established and maintained their own organization, creating a unique blend of semi-regulated, privately funded school systems. These early schools, through the development of Hebrew education over time, laid the groundwork for the grammar of Israeli education during its formation and even up through modern day.

In order to maintain this level of independence, early Jewish schools had to resist the temptation to rely on extensive British funding. However, the structure of the Jewish system and its incompatibility with British expectations allowed the Hebrew Education Department to justify resistance. The mandatory government considered budget to be the most influential tool over imposing will on local education, even when stacked against legislation and recognition of exams; as Elboim-Dror (2000) asserts, the British aimed to convince the Jews of the "power of the purse" in regard to educational advancement. However, though the Hebrew Education

Department agreed with many of the British's suggested reforms, as a decentralized, volunteer-based political structure, the Jewish system simply could not accommodate the demands from mandatory reform (Elboim-Dror, 2000). Thus, while Jewish schools in the mandate period did depend somewhat on British funding, much of their system could function independently. This outcome was in great contrast to the establishment of Arab schools during this time period.

While Jewish schools resisted the power of British funding to maintain freedom, early Hebrew education still desired respect and clout from Western powers. As such, they did make some additions to the system, such as standardized testing, so long as the result would validate the quality and worth of Hebrew education. In the early 1900s, standardized testing was becoming increasingly popular in Western education as a way to measure student achievement (Kamenetz, 2015). Consequently, according to Fried et al. (2018), during the period of Western influence over Palestine, the British exerted significant pressure upon Jewish leadership to create a standardized test, threatening to withhold respect and recognition for Hebrew education accomplishments. As a result, in 1933 the Jewish National Council under the leadership of Joseph Luria partnered with Hebrew University to create the first matriculation examination, known in Hebrew as the Bagrut (Fried et al., 2018). Thus, while early Jewish schools under the British mandate gripped firmly onto independence, Western powers still had influence over how the system conducted business. Ever since, the Bagrut exam in Israel has unwaveringly been a primary measure for student achievement

Muslim Education. Due to the Jewish resistance to external educational influence, the British mostly directed funding, protocols, and standardization towards Arab school systems However, in spite of all the attention, they never created a fully-functioning, regulated system and, instead, merely supported religious-based or religious controlled schools. According to

Elboim-Dror (2000), the mandatory government primarily aimed to modernize the local Arab population with heavy Western influences, raise the education level of underserved areas, increase economic efficiency within the system, and establish peace in the area by stifling nationalist sentiment within educational spaces. However, within their Arab targets, these efforts failed; Arab nationalism and low-performing students were rife within the mandatory-supported systems, effectively crushing the British goal to build a local elite (Elboim-Dror, 2000). As a result, the British reduced their efforts in Arab schools from encouraging excellence to merely enforcing regulation. The introduction of Western influence into standardized Arab schools marks the beginning of the crippled education system the future Jewish state would eventually inherit.

For the duration of the mandate period, the British increase access, funding, and infrastructure within Arab school systems. However, even with Westernizing developments and increased funding, these arrangements failed to meet the needs of Arab students. According to Elboim-Dror (2000), at first, the British Mandate only covered about 8% of elementary age children within Arab districts but would eventually grow to about 33% by the end of the mandate. British funding concentrated highly on the development of Arab schools, where during the 1930s, the government allotment for an Arab child was more than three times the size of financial support for a Jewish child. However, while the British contribution to education was notably better than the situation under Ottoman rule, only 1 in 4 Arab villages had a school and only 42,700 out of 260,700 school age students were in government schools (Elboim-Dror, 2000). While the mandate system proclaimed to want mutual peace in Palestine, demonstrating the “power of the purse” to Jewish schools by favoring Arab systems quite possibly could have

led to greater ethnic tension. The British Mandate allowed the ethnicity-based partition in education to exist, rather than exercising authority and enforcing integration.

Christian and Jewish Orthodox Schools. Muslim schools in the mandate system demonstrated a bifurcation of British support and control between Jewish and Arab systems; this pattern does not completely transfer over to the other religious schools. While the largest school system during the British Mandate mostly served the Muslim population, the most favored private schools were majority Arab Christian, which operated under semi-private church control. This group would become the most marketable school system for British success in the region. First of all, as Elboim-Dror (2000) indicates, these schools exhibited a much higher level of accomplishment than the Muslim schools and also flourished under a highly involved community. Thus, the British were able to save expenditure on these students while still reaping the benefits of Arab Christian reputation. These schools demonstrated the success of an imperialist mandate without requiring massive British spending (Elboim-Dror, 2000). Consequently, Arab Christian private schools maintained regulatory independence during the mandate period and enjoyed a high level of student achievement. To this day, private Arab schools (largely Christian) still maintain some of the highest performance and achievements in the Arab school system.

As is evident in the previous historical context, the British Mandate's approach to education in Palestine reinforced the separation of ethnic and religious-based systems, allowing privileged (Jews and Christian Arabs) groups the autonomy to remain isolated according to preference. Similar to both Christian Arabs and public Zionist situations, the Orthodox Jewish educational system during this time operated without involvement from the mandatory government, according to their preference. Elboim-Dror, (2000) found that the Orthodox Jewish

system largely remained separate from colonial influences, the New Yishuv, and Zionism, choosing to remain private and traditional. Their funding derived from philanthropy, so there was no dependence at all on British reform or funding; as such, Orthodox schools received only symbolic support from the British. Due to their traditional, religious format, the British could not necessarily boast over any tangible, Westernized standard of achievement in these private schools, yet Orthodox schools resembled the Arab Christian private schools in independence and respectful relationship with mandatory government (Elboim-Dror, 2000). Though this paper does not talk explicitly about this group in modern day (due to unique funding, curriculum, and distance from standards of achievement), this group further demonstrates the over-arching principle from this period in history: the mandate system enabled the ethnic division between Arab and Jew, while also allowing greater division within religious subcategories. To this day, Orthodox Jewish schools operate with considerable distance from the government-run Jewish and Arab schooling veins.

The Effects of the Mandate. By directing disproportionate focus on Arab education, the British started the developmental differences that would lead to two separate systems: one under public Mandate influence and one under private Jewish organization. Furthermore, by permitting separation and different levels of independence depending on ethnic or religious classification, they created the structure of the modern Israeli education system. However, while some of their influence encouraged differentiation between each education system, there were also reforms that would inclusively affect the entire Israeli system. As the Zionists would eventually form a new state in Palestine, this separated system of Jewish education would become the primary public-school system (Elboim-Dror, 2000). Additionally, referencing Elboim-Dror's (2000) discussion on British Mandate policy, Western presence would go on to influence major reforms

such as the Education Act of 1953, the structural educational reform of 1968, the redefining of a teacher's role, the evolution of the teacher's union, development of technical and vocational education, equity within education, and a more integrated, global curriculum. As a position of power, the British had the opportunity to force integration between Jewish and Arab systems; however, they allowed the Zionist Jews to build an entirely independent system based in segregation. In inspiring Western-style reforms, the British may be easily defined as a net positive influence in the long-term. However, such an interpretation ignores the historical roots the British planted, resulting in the modern discriminatory grammar within Israeli schools.

From 1948

Directly following the British Mandate, heightened independence, the formation of a new Israeli state, and growing demands from immigration forced a young Israeli government to adapt quickly. One of the biggest hurdles to overcome was how the new Ministry of Education would standardize and regulate an existing, privatized Hebrew education system in the new country's inheritance. The Ministry of Education, along with all other branches of Israeli government, came to fruition with the formation of the state of Israel in 1948 (Molcho, 2010). Previous Israeli systems of governance, as previously mentioned, had privatized Hebrew education from the very beginning; so much so, that, according to Molcho (2010), the first publicly funded Israeli high school did not even exist until 1946 in Tel Aviv. In this point of decentralization, the new Israeli education system, "had no relation to the state or the public, was not organized, and was in danger of becoming the property of the wealthy" (Molcho, 2010, p. 27). Thus, right from the beginning of the state, the Ministry of Education had to face the task of reigning in a fiercely independent Hebrew education system. This process would be the plight of the central government for many years to come.

Once the Ministry of Education began the attempt to restructure Hebrew education, there would be a 60-70-year period of failed attempts at complete educational regulation. While inheritance afforded Israel two systems – one Arab and one Jewish – the formative years of the state of Israel would focus mostly on building an effective, Jewish school system. The first proposal to regulate and organize secondary education was not submitted until 1952, four years after the establishment of the state of Israel (Molcho, 2010). Even then, the proposal accomplished very little, as it only pushed for the registration of schools rather than the centralization of the system (Molcho, 2010). The Ministry of Education had no information concerning the funding or budget of secondary schools because the majority of funding came from the student's tuition, and parents, private companies, and municipalities were the sole authorities over these institutions; thus, the secondary education system remained an independent, untouched sector until the 1970s (p. 27-32). There are many other failed education reforms from the Israeli Ministry of Education available for discussion (i.e. the 1968 Integration Reform or the 2004 Dovrat Reform). However, for the purposes of this paper, suffice it to say the Israeli Ministry of Education has not been entirely successful at integration, centralization, and equity. partially because of the complex system they inherited.

The Modern Israeli Education System

In modern times, the education system in Israel proper is mostly centralized and supports multiple, ethnically segregated systems. The Ministry of Education standardizes the measures of achievement and many resources across all localities, and, as a result, the existence of a persisting achievement gap between Jewish and Arab schools seems unlikely. Within the system, there are over one million students, each attending schools in one of the following categories: schools for Jewish, secular students, Jewish, religious students, Ultra-Orthodox Jewish students,

and Arab students (Katz, 2007; Abu-Saad, 2003). Even though Ashkenazi and Mizrahi Jewish students will often attend school together, in places where there is a mixed population of Jews and Arabs the schools are always segregated (Abu-Saad, 2003, p. 63). In spite of the different schools between Arabs and Jews, the progression of grades, the amount of compulsory education, major exams, and the teacher salary are all identical (Parker, 1981, p. 712). With all of the above factors being standard, one would assume that educational outcomes would be equal as well. The question is, "does Israel have an observable achievement gap based on ethnic factors?"

The data from the past ten years indicate that there are existing achievement gaps between Jewish and Arab students. As test scores in Israel comprise a significant portion of measured achievements, simply looking at the trends in these data demonstrate this very pattern. Perhaps most well-known in recent studies, Israel's performance on the 2012 PISA exam demonstrated the greatest achievement gap between high performing (Jewish) and low performing (Arab) students out of all of the Organization for Economic Co-operation and Development (OECD) countries (BenDavid-Hadar, 2018). Furthermore, in 2019, Dadon-Golan et al. found that Arab students were 30% less likely to be eligible for a matriculation certificate (Bagrut) than Jewish students – a consistent finding across 7 of the 11 years in the study. With such a substantial achievement gap evident throughout Israel's major exams, the question becomes, "why is there an observable achievement gap based on ethnic factors?" The historical division of Israeli schools based on ethnicity draws a lot of attention for local, political debate surrounding equity in education.

Within the debate, there seems to be a tug-of-war between personalization and discrimination. According to Abu-Saad (2003), "While the subdivisions in the educational system give it an appearance of accommodation of cultural differences and educational

pluralism, they exist more for the purpose of serving the interests of the dominant (Jewish) ethnic group" (p. 63). Further along this same point, though the system allows Arab schools to teach in Arabic, the Jewish government still monopolizes decision-making and curriculum development (p. 71). Moreover, from the perspective of the Arabs in the system, their schools and opportunities in education are not held to the same quality as those within the Jewish sector – a valid sentiment considering Arab schools have fewer classrooms, libraries, laboratories, and qualified teachers (Katz, 2007, 2010). The layout of the modern Israeli education system demonstrates significant gaps in achievement and resources between Arab and Jewish students, thus serving the contextual basis for this research.

Education Budgets in Israel

In February of 1998, the Ministry of Education approved Decision No., 3292, which implemented a budgeting system for education based on national priority. However, evidently, the decision focused entirely on strategic national advancement as opposed to equity. According to Adalah (2010), under Decision No., 3292, the government defined a new way of categorizing localities as National Priority Areas (NPAs). In accordance with the decision's criteria, as an NPA, a locality could receive "A" funding (significant funding) or "B" funding (moderate funding) (Adalah, 2010). Directing money towards priority areas is a logical investment for allocating educational budget according to neoliberal pursuits, however this focus neglected the demands of educational equity: though 33% of Israeli localities are Arab majority, of the 553 areas classified as NPAs, only four were Arab (Adalah, 2010). Essentially, through this system, the government wanted to identify the top 500 or so localities providing the highest benefits to the nation's economy and reputation, resulting in funding increases aiming to inflate the

localities' contributions. However, by examining this decision and the controversy around it, budget allocation emerges as a potential factor for inequity in the education system.

Public outrage and discontent among the Arab community followed swiftly after the decision, prompting Israel to reconsider the budget allocation. While the updated policy from 2009 seemed to amend any discriminatory neglect from 1998, the Arab community is skeptical of its intentions. Following the outcry, in 2006, the Israeli courts determined that the 1998 decision allowed for the illegal discrimination of Arabs, and in 2007, the Israeli Ministry of Education committed to implementing a plan to increase funding to Arab schools (Adalah, 2010). In July 2009, the government approved Decision No., 1060, which extended the NPAs so 40% of the recipients were Arab citizens (Adalah, 2010). While the NPA expansion does seem to mark a significant improvement, according to Adalah (2010), the Legal Center for Arab Minority Rights in Israel thinks the new decision simply opens a road for further discrimination and marginalization.

In further development, in 2016, the Israeli Ministry of Finance began the implementation of Resolution 922, a five-year plan for the economic development of Arabs in Israel. Through this 15-billion NIS budget, Israel proposed to increase spending in 15 fields of development, including education. According to Elran et al., (2017), the main education objective in this plan would go towards the construction of schools. Resolution 922 particularly funnels attention towards areas where the Jewish/Arab achievement gap is larger. Among these improvements, the five-year plan also pushes for greater teaching quality in Arab schools, the promotion of informal education, and higher education (Elran et al., 2017). Overall, the system of budget allocation in Israel has undergone significant changes over the last 20 years. By examining the budget data from just before Decision No., 1060, up to Decision 922, and through

modern day, this research can track the success of these plans and evaluate the effects of more equitable budget allocation on educational achievement in Jewish and Arab communities.

Exams in Israel

One unique exam to Israel is their matriculation examination, known in Hebrew as the *Bagrut*. As a necessary component for university admission, program admission, and even high-competition employment, the Bagrut exam is a primary indicator of student achievement in Israel. Ayalon and Shavit (2004) outline the requirements of the exam. First, the Bagrut evaluates proficiency in seven areas of study: English, Mathematics, Civic Education, Literature, History, the Bible, and Hebrew/Arabic. Based on a student's performance in these areas, the student receives no certificate, a basic matriculation certificate, or a university-qualifying certificate to accompany their high school diploma. To receive at least the base-level Bagrut completion, the student must take 20 units of tests across the seven subjects and pass all but one. In order to achieve the university-level certificate, the student must additionally pass an advanced-level English exam, pass any math exam, and pass one additional advanced exam (p. 103-104). Universities weigh Bagrut scores with the high school GPA and the results on another exam, known as the Psychometric Entrance Test, to calculate the student's university admission score (Azen, et al., 2002; Ebenstein et al., 2016). Thus, with the Bagrut playing such a vital role in a student's opportunity and life trajectory, this research uses matriculation certifications as the dependent unit of measurement to explore how budgets affect student achievement.

Literature Review

Within the specific study of standardized testing, scholars debate which of the varying socioeconomic, social, cultural, or political conditions cause discrepancies in test scores and to what extent. There are an endless number of factors to explore, but there are some infiltrating the

literature more frequently. For example, much of the academic dialogue narrows in on the status of a student's individual economic environment rather than picking apart the actual education system. According to Eagle's (1989) research, the most concrete discovery was the uncontested importance of a family's financial state (p. 13). Most of the current research validates socioeconomic factors as having the most significant effect on the achievement gap in racially diverse school systems (Brookover, 1985; Lewis-McCoy, 2014; Ball, 2017; Jencks & Phillips, 1998; Brunn-Bevel et al., 2015). While I do not discount the importance of socioeconomic factors in influencing student achievement, this paper seeks to critically evaluate systemic shortcomings and policy. Therefore, should socioeconomic factors come up as part of this paper's budget evaluation, then it will likewise emphasize the systemic nature of local socioeconomic conditions rather than the previous literature's attention towards the individual.

In addition to this factor, the literature extends to other potential causes for the discrepancy in standardized test scores, including the cultural or master narrative. Particularly in the study of Israeli education, cultural/master narratives are a very common causational variable, considering how the Israeli-Palestinian conflict permanently impacted Israel's national history. According to Bigelow (2014), master narratives in standardized testing are "an effort to put an end to a cacophony of voices on what constitutes truth, knowledge, and learning and what the young should be taught. It insists upon one set of answers," which "…vastly oversimplifies and misrepresents complex social processes – and entirely erases ethnicity and race as categories of analysis" (p. 128, 132). Specific to Israel, as Rotberg (2006) points out, the Israeli and the Palestinian narrative often completely oppose each other, as they see the same events from two different angles (p. 2). Research designs focus on such narratives differing between the Jewish and Arab education systems by viewing textbooks, sitting in on lessons, and observing the

reactions students have to the unfamiliar opposing narrative (Bar-Tal & Salomon, 2006). This approach is more system-focused than previous literature, as it evaluates the subliminal narrative in government sanctioned testing content. Therefore, once again, the research does not disprove the validity of this approach in qualifying inequity in standardized testing. Nevertheless, as narrative is already a very common vein of discourse in Israeli testing, this study will seek to highlight less popular approaches to systemic criticism.

Less Widely Accepted Causation

Another factor the existing literature briefly explores is test preparation. While the general consensus seems to implicate test prep as a primary influential agent for test scores, the scope of discourse is not wide enough to stake a solid claim. Within this somewhat smaller body of literature, scholars focus on the varying types of preparation (public versus private) and how they directly correlate to the scores each student receives (Alon, 2010). Other scholars acknowledge how the types of test prep that a student uses demonstrate some sort of inequality or favoring of advantaged students (Alon, 2010; Grodsky, 2010). In reference to existing Israeli literature, one author very briefly mentions a lack of preparation for Arab students in schools and another focuses on the way Israeli teachers teach the material (Arar et al., 2016; Zuzovsky, 2008). This smaller subcategory of discourse holds a lot of potential for implicating inequity in the Israeli education system, as preparation for testing is subject to variation an array of factors: teacher preparation, cost of resources (i.e. extra classes, practice books), availability of resources, language of resources, cultural compatibility to test material, and the amount of time required to prepare. However, considering the somewhat lacking discussion in regard to Israeli testing in general, by understanding budget and funding more fully in Israel, future research may be able to expand into accompanying testing resources.

Additionally, few scholars focus on individual choice as a leading factor behind test inequity. This narrow focus populates the discourse from the 80s and 90s. For example, Brookover (1985) discusses the role of teacher's perspectives, saying, "the perception of the bell-shaped distribution of learning ability, devised by the norm-referenced testing technology, is so ingrained … that teachers think it is not only impossible, but unkind to ask those students identified as slow to learn the objectives set for other children" (p. 267). Furthermore, Eagle (1989) and Zuzovsky (2008) introduce parental involvement in their kid's education as being a significant variable (p. 13). Lastly, Jencks and Phillips (1998) considers age, home environments, and test biases. Thus, this older discourse surrounding test accomplishment holds the individual circumstance rather than the system accountable for general test performance. In contrast, this thesis examines systemic factors to validate the role of society and government in inequity as opposed to the individual role, consistent with previously discussed theoretical frameworks.

Lastly, some scholars, in opposition to general trends, choose not to focus on a single cause that may lead to discrimination, but simply identify factors that do not play a role. Several academic works assert that money or schooling alone cannot be the source of the inequity problem for a variety of reasons. For example, Jencks & Phillips (1998) argue that research in testing gaps places far too much emphasis on economic disparity, and, consequently, having a financial focus will not yield successful policy. Additionally, other academics mention various rebuttals: the achievement gap exists before and after someone is in school, educational reform is more symbolic rather than legislative, and change may be better brought about by tackling poverty, health, or employment (Jencks & Phillips, 1998; Ball, 2017). While there is some merit to tackling broader issues and considering variables outside of financial allocation, this research

argues that financial policy implications within education can be effective towards change. Thus, while this line of academic discourse has merit, this paper disagrees with the effectiveness of their approach.

Budgets and Resource Allocation

Within the realm of budgets, funding, and resources, various scholars tailor their studies using specific definitions for "resource allocation." Likewise, this research clarifies a distinctive definition that will serve as the basis for language in this paper from here on out. For example, Eisikovitz (1997), who studies immigrant and minority education in Israel, found, "[Discrimination's] expressions are statistically demonstrated in the allocation of resources, teacher-student ratio, provision of facilities, lack of modern equipment, and other indicators" (p. 403). Likewise, Lavy (1998) looks at resource allocation in Israel and how variation therein affects student performance, using the assumption that "resource allocation" refers to teacher availability. For the purposes of this study, "resource allocation" or "budget," the primary term used in this paper, will encompass incoming and outgoing uses of financial resources in education. Thus, "budget" will include both sources of funding as well as expenditure, a dichotomy the literature often separates for individual focus.

On one hand, a select group of scholars explores the importance of government funding on creating policy and programs to aid test scores. Most of this scholarship focuses on the United States. For example, Garcia et al. (2015) created a study that explores the effects of funding on third to eighth grade test scores, specifically through the presence or lack of arts programs after the "No Child Left Behind" initiative. Additionally, Ladd et al. (2014) considers specific policies among third graders where the government focused funds on disadvantaged students. Both researchers found that the presence or lack of federal funding in these scenarios made an impact

on student achievement, but Cobb-Clark & Jha (2016) found the opposite in a study of Australian schools: “On balance, our results suggest that it is best to be cautious about the potential for increased funding levels to lift student achievement” (p. 260). Generally, the literature represents a lack of consensus within this academic debate. While these studies are focused on federal funding in America and Australia, this research will examine Israeli central government funding as a potential source for testing achievement. Thus, this paper will expand the importance of this variable into a new location and to a different age of students to further develop the validity of different sides to this argument.

Additionally, some research engages specifically with the role of expenditure as opposed to funding. The literature concerning the way expenditures affect test scores seem to be a united front: there is no relationship. Lee and Polachek (2018) examined New York districts over the course of five years and found that, while budget did decrease the drop-out rate in schools, there was no obvious effect on test scores. Cobb-Clark and Jha (2016) also weigh in on this debate, concluding that there was no correlation between expenditure per student and standardized test scores. As both incoming and outgoing finances in education constitutes the elements of the budget, expenditure will be a major area of focus in this research. Similar to government funding, this study will evaluate whether the general consensus about expenditure is true in Israel as well.

Internal versus External Financial Factors Theory

Regarding budget in underserved communities, Zeedan et al. (2017) explore whether internal or external financial factors impact Arab communities more substantially. Ultimately, their model demonstrating how local financial management (internal) holds greater weight on the

well-being of Arab systems than government grants (external) is the foundation for this research's set of hypotheses. According to the study:

> The new theoretical approach adopted in this research indicates that a "local management approach" that considers municipalities' political and financial management as the source of financial crisis is more likely to apply to local authorities than the "socioeconomic decline approach," which focuses on external causes. (p. 1080)

Furthermore, this work found a significant deficit for internal revenue in Arab communities, a finding supported by other scholars (Halabi, 2014). This research will expand Zeedan et al.'s (2017) theory to a new, educational context and examine whether internal or external budget factors affect not only general financial well-being but also educational achievement. Examining different manifestations of Israeli education budget as "internal" or "external" supports predictions about which budget factors and ethnic communities have the strongest influence on the relationship between the independent and dependent variable.

Locations and Methods

Existing literature explores standardized testing in several area studies across the globe, using case-specific methodologies. This type of research, logically, gravitates to centers of racial tension. As such, most of the sources I found were conducted using Black-White differences in America. These locations included Virginia, North Carolina, New York, and the Midwest (Alon, 2010; Brunn-Bevel et al., 2015; Boger, 2003; Grodsky, 2010; Lewis-McCoy, 2014; Lee & Polachek, 2018; Garcia et al., 2015; Ladd et al., 2014). Ball (2017) observed schools in England, Cobb-Clark and Jha (2016) studied Australia, and several scholars focused on Israel (Ebenstein et al., 2016; Eisikovitz, 1997; Arar et al., 2016; Shohamy, 2006, Lavy, 1998; Zeedan et al., 2017; Zuzovsky, 2008; Halabi, 2014). In these Israeli studies, however, the focuses were on other

causes for test score outcomes, such as immigration, pollution, and language bias. Only three mentioned budget or resource allocation while studying an Israeli case. While studies in standardized testing have somewhat spread into Israeli scholarship, the number of sources available for reference are minimal. As such, this research will expand the exploration of Israeli budget and test scores, qualify the claims of previous research, and use Zeedan et al. (2017) primarily in analysis.

Across the entire body of research, researchers logically explore the relationship between resources and achievement using different methodologies. The most common methods in current research were policy content analyses and longitudinal analysis (Jencks & Phillips, 1998; Eisikovitz, 1997; Arar et al., 2016; Ball, 2017). Aside from these common methods, Lewis-McCoy (2014) used an ethnographic approach, Bar-Tal & Salomon (2006) used narrative analysis and ethnography, and Boger (2003) looked at court decisions. Brunn-Bevel et al. (2015) used a mixed method that first examined state and district level test scores and then used those conclusions to direct future progressions within the study. Of all of the sources, a few matched my method; in Garcia et al., (2015), the authors used a quantitative framework and statistics, controlled for ethnic factors, and used an ANOVA test to assess variation. My complete method will follow a similar progression, using quantitative foundations to establish correlation while controlling for ethnic factors. Overall, the existing studies on this topic employ a stark variety of methodologies, with few providing methodological inspiration for the research design in this study.

Gaps

Overall, this research pulls in existing theoretical frameworks, expands the literature on budget and test scores, qualifies the relationships from previous research, further develops Israel

as a locational focus, and employs previously existing methods for analysis. While the components of this unique research do exist for the most part in preexisting bodies of scholarship, this paper encapsulates a tailored blend of ideas to create something unique and address gaps in the literature. First, this thesis adopts Zeedan et al.'s (2017) framework to distinctively evaluate inequity in education. Furthermore, from the conclusions of this study, the claims of Zeedan et al. (2017), Garcia et al. (2015), Ladd et al. (2014), Lee and Polachek (2018), and Cobb-Clark and Jha (2016) will be either qualified or challenged under a new application. Lastly, this study employs recognized methods of analysis to tie all of these elements together in a single project that will fill a cavernous gap in existing Israeli education literature. Following these contributions and conclusions, this paper has realistic and Israel-specific policy implications that could aid in reducing the achievement gap between Jewish and Arab students, and, at the same time, open the door for future research in this field.

Model and Hypotheses

The research models for this paper will consist of three levels of analysis to answer the primary research question. In doing so, the paper establishes a variable relationship, uncovers the effects of a control variable, and evaluates the relevance of the different categories within independent and control variables. First, this research identifies the potential for an existing correlational relationship between budget and test scores in Israel. Second, within that established relationship, the research will examine whether demographic categories have an impact. Third, this research will directly compare different types of budget allocation and the different demographic categories against each other to identify nuance and variation within the overarching variable relationship. Both the research model figures and the hypotheses represent the various levels through which the variable relationship is examined in this research. In doing

so, this paper unites previous scholarship and independent research to explore the research question on a multi-tiered level.

Figure 1 and the hypotheses from Appendix A, Table A1 represent the model and predictions for the first level of analysis: the establishment of a relationship. This research asserts argues for an existing, positive relationship between budget and test scores in Israel, which originates from the findings of the previous research in the literature review section. In the figure, the arrows represent the presence of a relationship, and in the table each of the hypotheses uses the following language to indicate the same prediction:

> **Hypothesis Part 1:** "If you increase the [budget variable] in a particular municipality, then the [test score data] in that municipality will increase as well …"

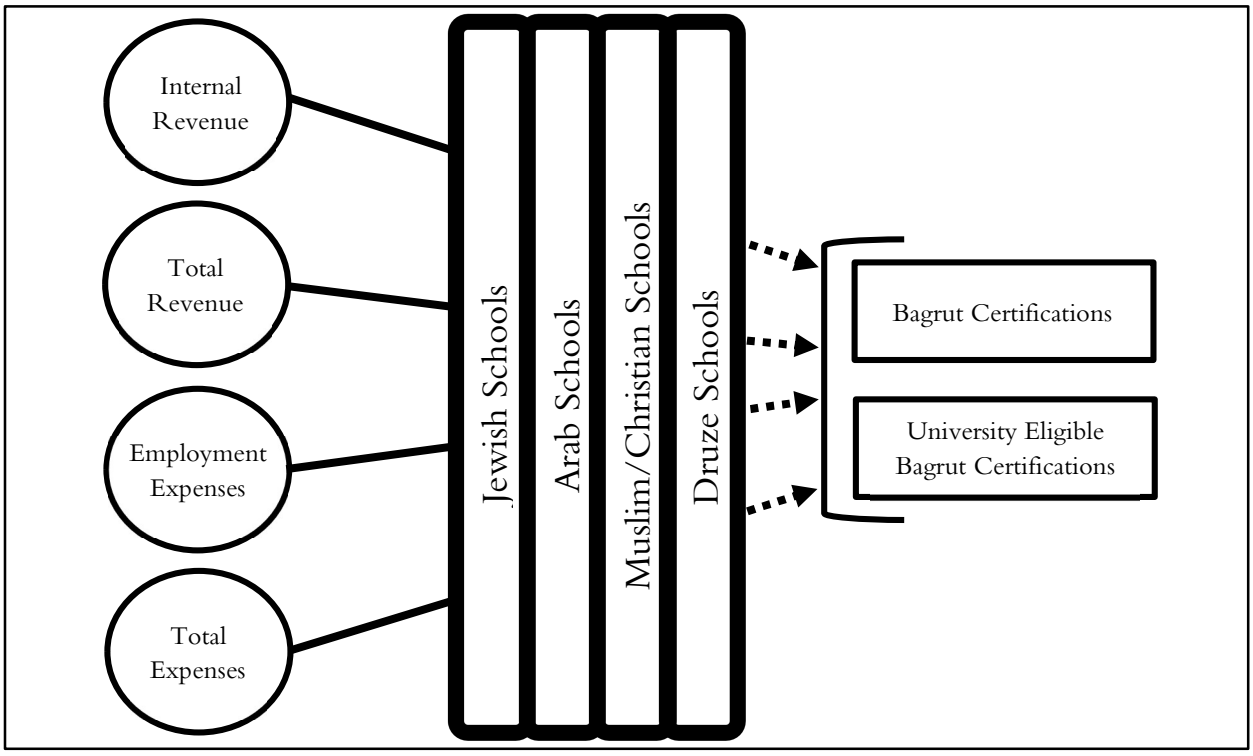

Figure 1: The Relationship Between Budget, Test Scores, and Demographics Model

Additionally, Figure 1 and the hypotheses in Table 1 also demonstrate the second tier of analysis: the influence of ethnicity on the primary independent and dependent variable relationship. The model asserts that controlling for demographic classification will uncover alterations in the original relationship. In Figure 1, the different types of school systems based on ethnicity act as a sort of filter through which the budget and test score relationship passes, ultimately creating variation within the umbrella relationship. The second part of each of the hypotheses echo the change resulting from ethnicity as a control variable:

> **Hypothesis Part 2:** "with [Jewish/Arab] results being more correlated than [Jewish/Arab] results."

This model asserts the power that the control variable has to alter the outcome of the relationship between budget and test scores.

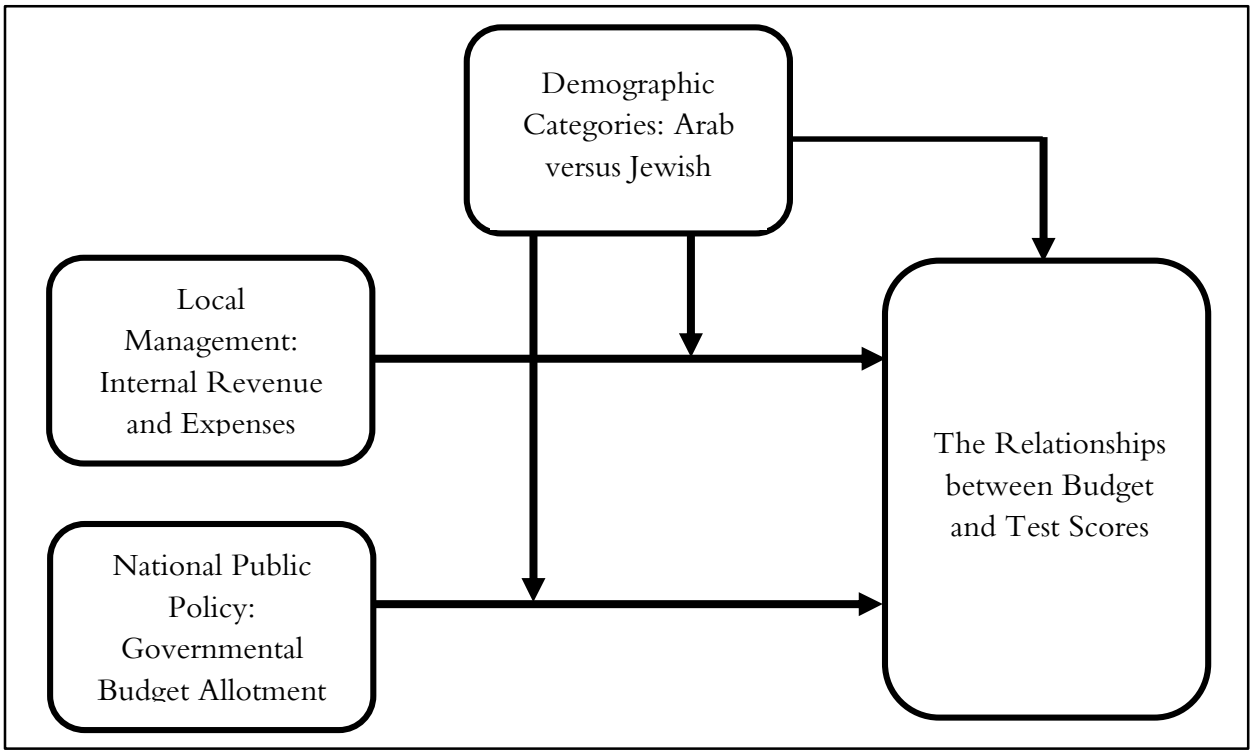

Figure 2: Relationship between Levels of Independent and Control Variables Model
Adapted from (Zeedan et al., 2017, p. 1071)

Lastly, Figure 2 and the organization of Table 1 show the third level of analysis: exploring the different categories of budget allocation and how that affects test scores while controlling for demographic variables. The model is adapted from Zeedan et al. (2017) in their discussion of internal versus external financial factors. In Figure 2, this research predicts that internal factors will have more of an impact in areas of financial crisis, with the following assumptions: 1) internal budget factors will include internal revenue and all spending data, as local influences are more likely to impact these financial measures than central governmental influences; 2) external budget factors include governmental budget allotment; 3) as Arab localities are more likely to be in a state of financial crisis (Zeedan et al. 2017), internal factors will have more weight on their student achievement compared to Jewish counterparts. These predictions and assumptions are also present in the organization of Table 1. In examining this model with these assumptions, this research will either expand the local management approach model into the realm of education or place limits on its applications.

Limits

Using Zeedan et al. (2017) as a theoretical base enriches this project's analysis through the creation of a third layer of examination; however, four measures of budget variation, with three being internal and one being external, are not adequate to elevate the application of this theory to full potential. While the current measures of budget were the most appropriate for the design and scope of this project, future iterations of the study would need to include greater amounts of variables and more balance between internal and external representation. Therefore, while this theory and model supplements the current thesis project, to be a strong, primary reference for analysis, the future would require an expansion of the variable selection.

Methodology

Previously in this paper, previous sources demonstrate discrepancy in the test scores between Jewish and Arab students. This paper explores the differences in budget between the different school systems as a possible factor in test score outcomes. To this end, this research employs comparative quantitative methods to observe the effects of different budgeting factors on test scores, while controlling for Arab and Jewish populations. Israeli data from each year from 2008 to 2018 will comprise the foundation of the research.

Data

The Israeli Central Bureau of Statistics (CBS) has publicly released data files for every year from 2008 to 2018 for public use. The general format of the raw data is mostly consistent across all years, with some variation. Each of the sourced Excel workbooks contains data in two categories: Physical and Population Data and Financial Data. Each of these Excel sheets sort the relative data by *municipalities*. In Israel, a municipality, also interchangeably called *locality*, is a city that has an official municipal status according to the Ministry of the Interior. The variation for consideration across different years includes but is not limited to: earlier years further separate physical and budget data into sheets based on municipality size, over time, the specific identifiers for observational columns change, and early years usually have fewer localities in the list according to the creation/destruction of municipal boundaries. The methodology for this project sources the raw data from these data files, cleans and transforms them, and accounts for yearly variation. The specific data for my analysis is as follows (see Table A2 in Appendix A):

Test Scores: Independent Variable

In the files from the Israeli CBS, the Excel sheet corresponding with Israeli Bagrut certificates is “Local Authorities (Year)” and is under the Population and Physical Data tab of

the file. Under the education section, the columns containing important information necessary for this research are “The Percent of 12th Graders Eligible for a Bagrut Certificate” column and “The Percent of 12th Graders Eligible for Bagrut Certificates that Meet the University's Threshold Requirements” column. As mentioned in the background section, students can receive either a standard Bagrut certification or a university eligible Bagrut certificate, depending on their scores in certain areas. The raw data for these measures are percentages of the 12th grade population in each locality to receive either of these certificates. As the dependent variable, the variation in these test scores relative to changes in the independent variable will evaluate the role of budget in Israeli education. Likewise, by looking both at standard and university certificates, this research can test this variable relationship on different levels of achievement, thereby evaluating whether a relationship would impact minority career paths and higher education.

Budget: Dependent Variable

The Excel sheet corresponding with Israeli education budgets is called, “Local Government Financial data for [Year] (Thousand Shekels).” The worksheet contains a variety of budgeting information that is not relevant for this project; as such, I will outline the data points taking part in the analysis. The first iteration of budget data from the CBS spreadsheets is the total revenue for education in each Israeli municipality. These data points quantify the amount of money that each municipality receives to fund education. Specifically, this total encompasses two numbers: the revenue acquired from internal, local payments (from surrounding residents) and the amount of money each municipality receives from the Ministry of Education. These two numbers, added together, should total to the amount represented by this first data point. Though this particular measure of budget data is comprised of two measures, the entire variable represents the “external” component of financial systems in education in this research because it

is at least 85-95% comprised of funding from the central government. By examining this data point's effect on test scores, the project draws conclusions on the role that government plays in equitable budgeting allotment, and therefore, where financial inequality establishes roots.

Alternatively, the second iteration of budget data for this research is internal revenue. As a subcomponent of "total revenue," internal funding shows how much of the total revenue comes from within or from outside the locality. Considering the "government funding" data is missing from most years, the combination of internal and total revenue sources the apportionment of funds in each locality. On its own, internal revenue data embody all income that does not come from the central government. This variable can include fees, donations, and local taxes. Internal revenue is a known source of disparity in Israel between Jewish and Arab localities, as discussed in the literature review section. Consequently, examining these data not only exposes a known, internal gap in educational equity but is a factor in calculating the aforementioned external factor of funding.

The last measure of budget data for this project is from the expenditure section in the same workbook as the revenue data. These data points detail two separate quantities: the amount of total expenses for education in each municipality and how much of those expenses paid for employment. Similar to the revenue data, using a total value and a subcategory within that total indicates the apportionment of locality expenses. For employment expenses, the data include teacher wages, overtime, travel allowances, and training. Total expenses data encompass everything else: maintenance, transportation, housekeeping, and security. These data points further solidify the discussion of internal budget management versus external allocation by informing the study of where money goes once it reaches a locality. By tracking the direction of education expenses in conjunction with test score achievement, the research can establish a

correlational relationship between the independent and dependent variables, while also understanding how different measures within the variable relationships create variation.

Demographic Factors: Control Variable

As a control variable, the research uses ethnicity as a measure for demographic variation. The categories within this variable are Jewish and Arab, which has further subcategories for Muslim, Christian, and Druze Arabs. Ethnic classifiers not included for this particular project are Mizrachim, Ashkenazim, Sephardim, Ultra-Orthodox, and immigrant subcategories. The data for Jews, Arabs, Muslims, Christians, and Druze according to each municipality is in the demographic section of the Local Authorities (Year) sheet. The unit of measurement is percentage within the entire locality population. Using these data, each municipality receives a primary Jewish or Arab categorization (with an accompanying sublabel for Arab localities), which functions on the assumption that the best way to control for these factors is by treating municipalities as individual actors. Thus, these data contribute to a major academic assumption within this research and supports a primary function: to track variable relationship variation within ethnic categories.

Collection and Organization

Considering the large amount of data required for this project, the first step for organization was to create a master spreadsheet with all of the variables from the years 2008 to 2018. Starting with the 2018 data, I constructed a new Excel spreadsheet and transferred the list of Israeli localities from the CBS workbook to my new file. For ease of use, I translated each locality name into English. To fill the rest of the spreadsheet, I compiled all of the data from the columns outlined in Appendix A, Table 2 plus the number of students in each municipality, being sure to align each observation with the correct locality. I then created a new sheet tab for

each of the years across my time series, copying the same data from each year. To standardize the data, I used the municipality order from the 2018 CBS file and used the MATCH() function (see Appendix B) in each of the subsequent year files to compensate for variety in locality order, the creation of new localities, the merging of old localities, or variety across CBS workbook formats. By the end of this process, I had a workbook with 11 tabs representing the time frame, with 14 columns in each sheet to represent the raw data for the variables. This collection process united all of the data across 11 years in one place, while at the same time standardizing the data across the yearly alterations.

Following the collection of the raw data, I needed to transform existing numerical figures to better suit the needs of my analysis. First, the measurement of the CBS budget data was in 1000 New Israeli Shekels (NIS) and the demographic data only included percentages of each ethnic community. To account for school population, the budget data needed to be in NIS per student, and to help the analysis control for ethnic community, the demographic data would need to be categorical rather than continuous data. For this transformation, I added an additional 7 columns to each sheet tab for internal revenue, total revenue, employment expenses, and total education per student as well as locality majority and Arab subgroup. To convert raw budget data into NIS per student, I used the IFERROR() function (Appendix B) in each of the four new budget columns. To auto-populate the new ethnic majority column, I used the IF() function (Appendix B), which located the ethnic majority constituting 50% or more of the population and assigned the respective categorical designation (“Jewish” or “Arab”). To populate the Arab subgroup column with “Muslim,” “Christian,” or “Druze,” I used the second IF() function (Appendix B), which checked for 50% majorities in the subgroups, only if the previous column read, “Arab.” Since these formulas are all based on a clear 50% majority, which works for nearly

all cases, I double-checked for any localities with a closer proportion across subgroup populations and made sure the column contained the correct majority designation. Once all of the new data were added, I sorted all of the sheet tabs by Jewish/Arab locality and then by Arab subgroup. This process of organization adjusted the presentation of variables in a way that would be most conducive for the coming analysis. Failure to do so would have offered potentially misleading budget data or complicated control by ethnic community.

Analysis

The first element I needed to establish was whether these prospective variables exhibited variation within each ethnic community. To do this, I calculated averages of each of the independent and dependent variables by community each year. The ethnic communities included Israel (entire country), Jewish, Arab, Muslim, Christian, and Druze. To do this, in Excel, I used the AGGREGATE() function (Appendix B) and entered the outcomes into tables under the sheet tab "Tables." I then connected these tables to an R Script for visual representation. The R Script (Appendix C) created line graphs for the following trends: Bagrut scores over time, university Bagrut scores over time, internal revenue for education over time, total revenue for education over time, expenses for educational employment over time, and total expenses in education over time. From these visuals, I could ascertain whether or not budgets and test scores varied across a time-series project. Without variation, there would be no interesting relationship to observe within this research.

Following this process, I then started to visualize the general relationship between budgets and test scores to establish correlation. In order to do this, I needed to consider all data pairs irrespective of year and ethnic community. I created a new sheet tab in my workbook entitled "Combo," which gathered all budget data per student, Bagrut scores, and demographic

categories from 2008 to 2018 into one place. Using these data, I created a new R Script (Appendix D) to present the data in X/Y scatter plot format with trend lines. These graphs (eight in total) portray the relationship between

1) Internal Revenue (X) and Bagrut Certificates (Y);
2) Internal Revenue (X) and University Bagrut Certificates (Y);
3) Total Revenue (X) and Bagrut Certificates (Y);
4) Total Revenue (X) and University Bagrut Certificates (Y);
5) Expenses for Employment (X) and Bagrut Certificates (Y);
6) Expenses for Employment (X) and University Bagrut Certificates (Y);
7) Total Expenses (X) and Bagrut Certificates (Y); and
8) Total Expenses (X) and University Bagrut Certificates (Y).

Through these representations, I gauged any existing correlation between the variables, which informed me how to proceed for the rest of the analysis. From here, I determined that using inferential statistics, specifically bivariate regression, would fortify the correlations demonstrated in the graphs.

For the statistical analysis, I created a new sheet tab called “Statistics” in my workbook. I calculated correlations for each of the variable relationships presented through the graphs in the previous paragraph, but, this time, controlled for ethnic community. Once again using the “Combo” data, I used the CORREL() function (Appendix B) to calculate the correlation coefficient for each variable relationship within Israeli, Jewish, Arab, Muslim/Christian, and Druze populations. Note, for the statistical analysis, I combined the Muslim and Christian cases, since the numbers of Christian majority localities is not substantial enough for individual statistical consideration. Furthermore, to assess the “statistical significance” of each correlation

coefficient, I calculated the p-value using N, the T-statistic, and the degrees of freedom (functions in Appendix B). From here, I created a table to represent the correlations and the p-values, which was the basis for my main analysis. Using this method, I strengthened the variable relationships from previous descriptive methods. Thus, this quantitative method will exhaustively examine the relationship between Israeli educational budget and Bagrut exam scores in respect to various ethnic groups in Israel.

Findings

Variable Trends Over Time

Bagrut Data through Time

Since 2008, test scores in Israel have steadily increased across all demographic categories. The data in Figure 3 indicate that the most significant increase has been in Arab communities. However, even with evidence for improvement in some Arab Israeli communities, the majority still trail behind Jewish counterparts. From 2008 to 2018, Jewish schools increased from 61.25% to 74.38%, a percent increase of about 21% (where 100% increase means the average has doubled), while Arab schools increased from 45.47% to 66.68%, an increase of about 47%. Within the Arab community, however, there is a large disparity in the extent of that increase; Muslims grew the least with an increase of 40% while the Druze surged upward with ~+69%. With the range of growth across Arab communities, Muslims, who actually occupy the vast majority of Arab localities in Israel, have just recently passed average Jewish test scores from 2008; the Druze community, however, has surpassed the Jewish test scores in 2018. In summary, across-the-board advancement in test scores presents a positive prognosis for equity in Israel. However, when examining separate demographic groups, inconsistency within Arab subgroups suggests that educational achievement is complex beyond the Jewish/Arab binary.

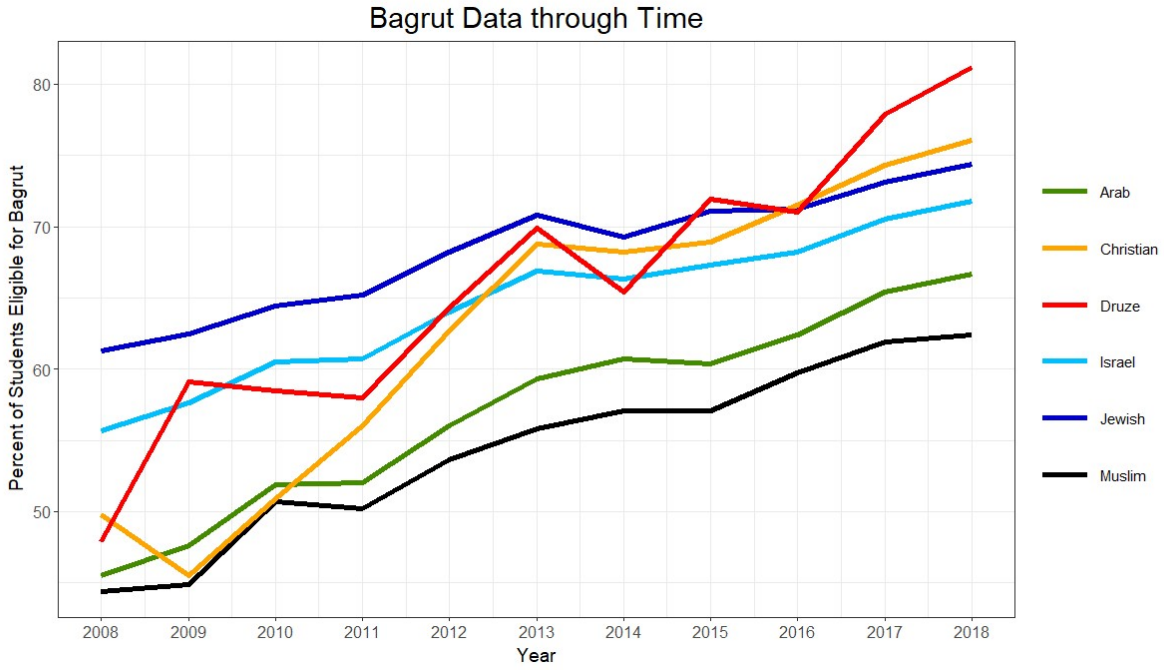

Figure 3: Bagrut Data through Time

Examining the individual localities from the years 2008 to 2018 further solidifies these trends. Using the top and bottom three localities from each ethnic group years 2008 and 2018 reveals three patterns: 1) the highest Arab test scores and the highest Jewish test scores actually slightly overlap in 2018 as opposed to 2008, 2) in Arab communities, the highest scoring municipalities have shifted to more non-Muslim locations, and; 3) the current 2018 range of Arab test scores closely resembles the Jewish range from 2008. In Israel currently, the highest scoring Jewish localities are Tamar[2] (100%), Elkana (94.7%), and Kfar Shmaryahu (94.4%), while the highest scoring Arab localities are Kaukab Abu al-Hija (94.7%), Hurfeish (91.2%), Kisra-Sumei (89.3%). Of these highest Arab localities, two of them are Druze and one is Muslim, as opposed to the two Muslim and one Druze from 2008. In 2008, the range of test

[2] For this section and all following sections referring to individual locality stats, outliers will be excluded from the analysis, including those locations with unusual populations (i.e. Jerusalem) or extreme results.

scores in Jewish majority localities went from 36.7% (Ofakim) to 92.5% (Savyon), and in 2018 the Arab range is 31.1% (Ar'arat an-Naqab) to 94.7%, which is much closer to the Jewish range than the Arab 25.2% to 75% range from 2008. Overall, these trends further engrain previous claims represented by locality averages. The distribution of Arab scores is approaching the averages of their Jewish counterpart, with many Arab localities performing just as well if not better than Jewish localities. Furthermore, considering that two of the top three Arab localities are Druze, in spite of the much lower number of Druze communities compared to Muslim communities in Israel, shows how non-Muslim communities are rising up in the ranks and representing variation within general Arab trends. The patterns within these data, specifically the variation between Arab and Jewish localities, is consistent with this research's hypotheses, stating that ethnic factors impact budget and testing variables.

University Eligible Bagrut Data through Time

Similar to the trends for general Bagrut data, the percentage of matriculation certifications eligible for university acceptance have also increased across all Israeli communities (Figure 4). However, once again, there were different trends amongst the subgroups of Arab localities. Within the Jewish/Arab binary, the percentage of university eligible matriculation certificates increased by 22% (53.52% to 65.23%) in Jewish localities and 49% (35.32% to 52.54%) in Arab localities. Interestingly, the Jewish percent increase is very close to the increase for normal standard Bagrut results, while the Arab increase was actually higher in the university level. The drastic incline appears to be attributed to increase in Druze test scores; while Muslim localities increased by 41%, very close to the standard Bagrut, Druze localities increased by 77%, which is much higher than the previous increase. Nevertheless, even with these massive improvements, the Druze community still lags behind the Jewish average in 2018, and the

Muslim community has yet to hit the average for the Jewish community from 2008 (53%). Overall, the university Bagrut scores exhibit a similar increase compared to the standard Bagrut, except for the Druze community who have extended their upward reach even more. However, unlike the standard Bagrut, no Arab community has caught up with Jewish averages in the same way. Thus, while improvement in achievement appears exhaustive, these data indicate that there are still notable achievement gaps between Arab and Jewish schools, particularly between Muslims and Jews.

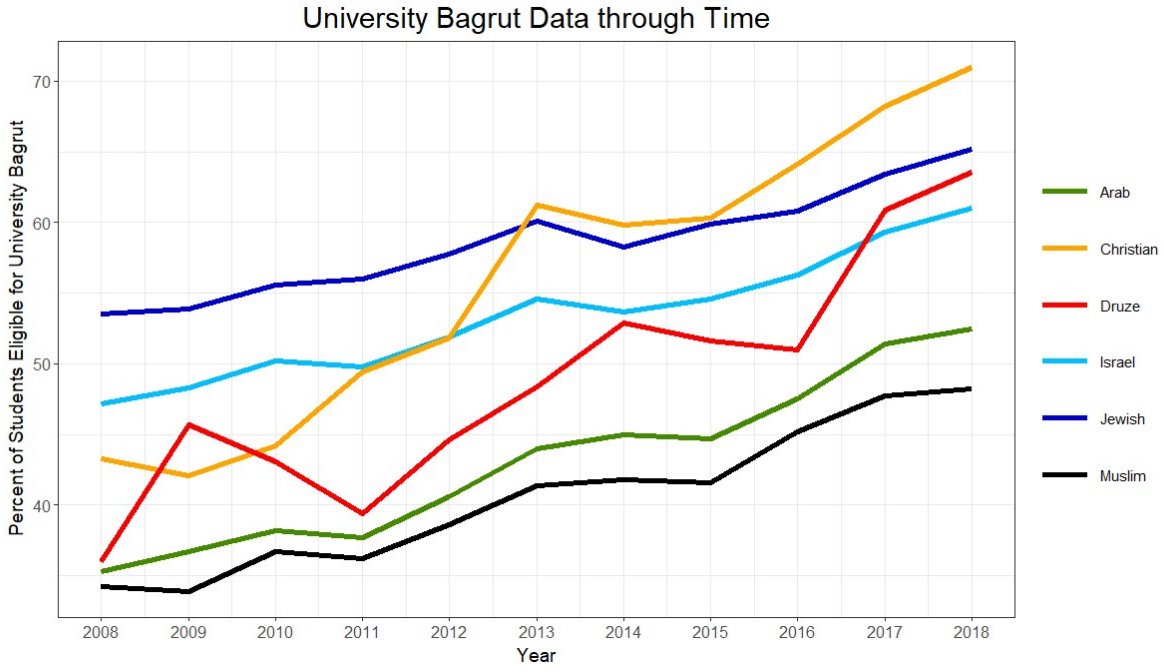

Figure 4: University Bagrut Data through Time

Using the same logic and data as the standard Bagrut certificates, examining the specific localities reveals the differences between the two measures of achievement. There are three patterns in the university eligible Bagrut data for direct comparison and contrast: 1) There is no overlap between the high scores of Jewish and Arab localities in 2018; 2) once again, the higher scoring Arab localities migrated towards non-Muslim majority locations from 2008 to 2018, and;

3) the Arab locality range in 2018 does not closely match the range from Jewish localities in 2008, particularly on the lower end. First, the three highest scoring Jewish localities from 2018 were Savyon (93.4%), Kfar Shmaryahu (91.7%), and Tamar (90.0%), while the Arab highs were Fassuta (86.5%), Peki'in (81.6%), and Mi'ilya (81.3%). Of the top three Arab localities, none of them were Muslim majority (two Christian, one Druze), as opposed to two Muslim and one Christian from 2008. Lastly, the range of Jewish university eligible test scores in 2008 ranged from 27.7% (Kiryat Malakhi) to 92.5% (Savyon), while Arab test scores currently range from 12.0% (Ar'arat an-Naqab) to 86.5%. Evidently, some differences exist between standard and university eligible Bagrut trends. Arab university-eligible scores are further away from matching Jewish trends, even from 2008, and many Arab localities have yet to reach the lowest part of the Jewish range. However, similar to standard Bagrut trends, the highest Arab spots are filled by non-Muslim localities in spite of their greater minority status, also demonstrating variation within the greater Arab community. Similar to the standard Bagrut data, the variation in university eligible test scores across ethnic groups supports the hypotheses' prediction.

Limits. While the data in this section come from reliable sources and underwent a standardized, widely accepted method of transformation, the Bagrut trend data represent an area of improvement for future iterations of this study. Unlike the budget data, the raw Bagrut data represented an existing system of averages, meaning the Bagrut scores for each locality had already experienced one round of mean calculations. Therefore, in calculating another set of means according to demographic data, the results became skewed. While it would have been prudent to search for individual test scores per locality or already-accepted national averages by community, these resources were unavailable at the time of the project. Therefore, while these averages are altered, they do closely resemble published averages from the Ministry of Education

and represent a previously enforced trend of increase amongst test scores. Thus, for the purposes of this paper, the previous Bagrut averages serve as the most accurate measures available and were subject to standard analysis until an alternative source is obtainable.

Internal Revenue for Education through Time

Among all the variables for this research, internal revenue was the only one that did not demonstrate a general upward trend or exhaustive percent increase from 2008 to 2018. In addition to this time-series flatline, the graph for these data (Figure 5) also very clearly demonstrates a chasm between the internal revenue of Jewish and Arab localities. Across the demographic controls, half of the categories had a net positive change (general Israel, Jewish, and Druze) and half had a net negative change (Arab, Muslim, and Christian). The most severe fluctuations included -30% drop in Christian internal revenue and +76% in Druze internal revenue. While these trend lines represent only consistent vacillation, the most distinct pattern is the difference between Arab and Jewish communities, wherein no Arab subgroup acquires even half of what Jewish communities collected in 2008 (872 NIS/student). This collection of budget observations demonstrates the most erratic levels of variation out of all the variables. Furthermore, internal revenue indicates one area where Arab and Jewish communities continue to extremely diverge.

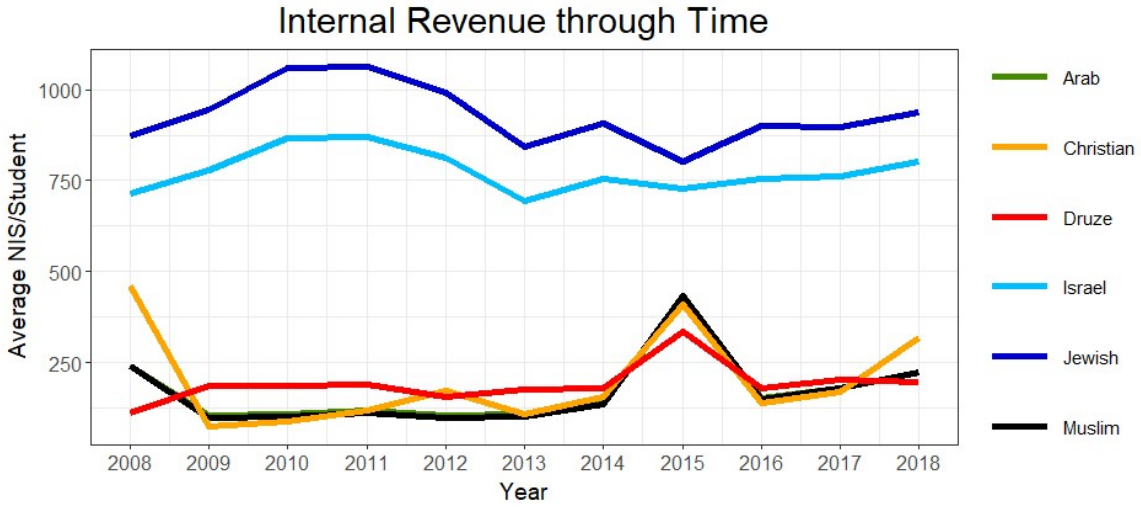

Figure 5: Internal Revenue for Education through Time

Examining individual localities represents the same Jewish and Arab divide that the general averages do. While the Jewish localities with the lowest internal educational revenue in 2008 and 2018 are certainly low, the highs are so much higher than Arab localities, that the averages climb to their current location on the graph. Furthermore, regarding Arab subcategories, no significant variation between 2008 and 2018 manifest in the data. The three Jewish localities with the highest internal revenue in 2018 were Kiryat Bialik (10,908.2 NIS/student), Rosh Pinna (7,625.6 NIS/student), and Kiryat Motzkin (6,585.2 NIS/student), while the highest 2018 Arab localities were Tuba-Zangariyye (1,821.9 NIS/student), Kfar Bara (1,140.2 NIS/student), and Mazra'a (1,012.7 NIS/student). In contrast, the lowest 2018 Jewish localities were Kfar Shmaryahu (17.1 NIS/student), Ramat Yishai (39.2 NIS/student), and El'ad (81.5 NIS/student) with the lowest Arab localities being Bi'ina (4.1 NIS/student), Ein Mahil (4.3 NIS/student), and Bir al-Maksur (4.6 NIS/student). Compared to 2018, the 2008 ranges were as follows: Jewish majority localities were 27.0 NIS/student (Kiryat Ye-arim) to 11,369.4 NIS/student (Har Adar), and Arab majority localities were 1.4 NIS/student (Kfar Bara) to 3,121.8 NIS/student (Bnei

Shimon). All high and low Arab localities listed above from both 2008 and 2018 are Muslim majority. Thus, the broad scope of Jewish and Arab ranges in the year 2018 demonstrate an immense difference in internal revenue. Interestingly enough, comparing directly between 2008 and 2018 shows that both ranges have actually shrunk over time, with Arab communities taking a massive loss on the upper end of the distribution. Overall, internal revenue in education does not seem to vary within Arab subcategories or over time, but rather only greatly varies between the Arab/Jewish binary. These results are both surprising and consistent with the hypotheses; the large difference between Jewish and Arab localities demonstrates the cross-ethnic variation predicted in this relationship, but, at the same time the absence of positive variation over time throws the correlation between increasing budget and increasing test scores into question.

Total Revenue for Education through Time

Straightaway, the data for total revenue returns to a more consistent upward trend than internal revenue (Figure 6). With the exception of Christian communities, by 2018, nearly all demographic categories converged into the same level of revenue per student. The greatest increases from 2008 to 2018 were in the Muslim and Druze communities, who more than doubled their total revenue (116% and 113% increase respectively). The smallest increase was in Christian localities, which still saw a 46% increase. As the smallest demographic representation, however, the Christian trend hardly effected general Israeli and Arab trends, with all other five categories settling closely to 10,000 NIS/student. Total revenue demonstrates a much different trend than local revenue, with tangible evidence of growing equality across demographic variables. Considering the previous discussion on internal revenue and the persisting divide between demographic communities, the equalizing trend is likely attributed to the other factor in calculating total revenue: The Ministry of Education.

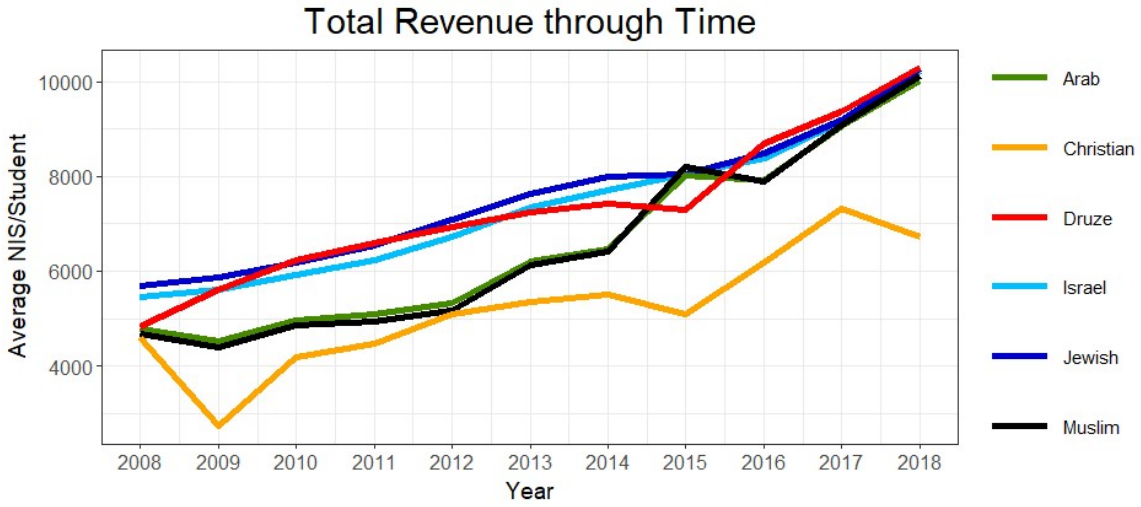

Figure 6: Total Revenue for Education through Time

Considering the lower internal revenue in Arab communities and the equalized total revenue across all categories, reasoning suggests a potential equitable strategy within governmental budget allocation over the last 11 years. Essentially, the Ministry of Education appears to be making up the difference left by low/high internal revenue. In 2008, Jewish and Arab revenue sourced about 15% and 5% of their revenue respectively within their own communities. In 2018, the numbers dropped to 9% and 2%, allowing governmental funds to occupy a greater majority of total revenue. Specifically, in 2008, the Ministry contributed slightly less money to Arab localities than Jewish localities per student (4,530.1 NIS/student vs. 4,804.6 NIS/student), and in 2018, the Ministry contributes slightly more to Arab areas than Jewish areas (9,786.8 NIS/student vs. 9,345.5 NIS/student). Effectively, the data show that the Ministry of Education appears to be making up for the natural deficit within Arab internal revenue. By comparing internal to total revenue over time, the variation indicates positive attention towards Arab communities, whether intentional or not.

To further solidify the general trend towards equalization in total revenue within education, this paragraph examines specific localities and ranges across time. Overall, from 2008 to 2018, the Arab range exploded upward while the Jewish range stayed more or less the same. In 2008, the Jewish range for total revenue in education was 1,324.4 NIS/student (Rekhasim) to 57,776.4 NIS/student (Aravot HaYarden) while the Arab range was 1,561.0 NIS/student (I'Billin) to 15207.1 NIS/student (Bnei Shimon). In contrast, in 2018 the Jewish range was 3,187.1 NIS/student (Rekhasim) to 54,845.9 NIS/student (Mevo'ot HaHermon) and the Arab range was 4,156.2 NIS/student (Ka'aviyye-Tabbash-Hajajre) to 20,667.9 NIS/student (Kfar Bara). From 2008 to 2018, the Jewish range from low to high shrunk from 56,452 NIS/student to 51,658.8 NIS/student but the Arab range expanded from 12,954.6 NIS/student to 17,385.4 NIS/student. Once again, all above-mentioned Arab localities are all Muslim majority. While there still does seem to be a major disparity presented by the range, the directional increase of Arab allotment and the overall average show that the Ministry of Education contributed significantly to the increase of total revenue over time, considering the lack of increase in internal revenue. Furthermore, there was no significant change in Arab subcategories among the highs and the lows, demonstrating an equalizing increase in governmental allocation, consistent with the general equalizing trend from the previous graph depicting total revenue in education. Similar to internal revenue, consistent with my hypotheses, increased attention on Arab communities demonstrates Jewish/Arab variation within this variable.

Expenses for Employment in Education through Time

Expenses for employment within education showed the most consistency across all demographics with a steep upward trend (Figure 7). By 2018, though some Arab communities still trailed below the Jewish trend, the Druze once again exceeded it. Across the 11 years, the

greatest increase in employment expenses is in Muslim (+130%) and Druze (+125%) communities. The smallest percent increase was in Jewish communities at +74%. In the most recent year of measurement, the Druze now spend the most on employment per child and all other Arab communities have far exceeded the Jewish averages from 2008. This budget variable demonstrated another element of definite variation over time. More importantly, these data highlight another instance wherein the Druze community have differentiated themselves from other Arab groups, even going as far to dwarf Jewish averages.

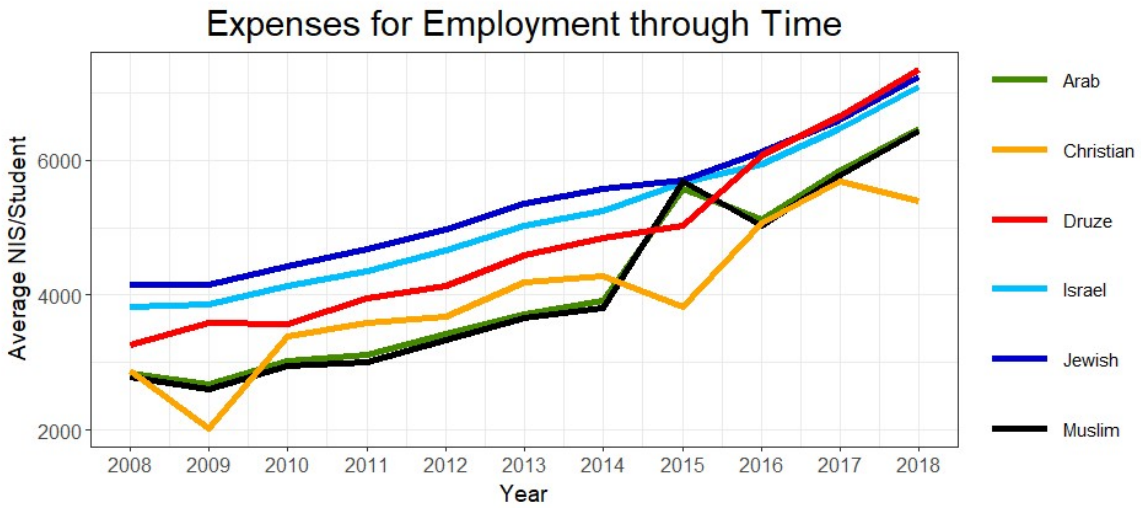

Figure 7: Expenses for Employment in Education through Time

Looking at the individual highs and lows within expenses reveals related trends, without the benefit of seeing any change across Arab subcategories. The changes of both Arab ranges and Jewish ranges indicate a drastic increase in expenses for educational employment. In 2018, the highest Jewish localities were Mevo'ot HaHermon (29,688.8 NIS/student), Ma'ale Yosef (25,270.1 NIS/student), and Harish (20,633.4 NIS/student), and the lowest were Beitar Illit (346.6 NIS/student), Nahal Sorek (569.2 NIS/student), and Modi'in Maccabim-Re-ut (688.9 NIS/student). For Arab majority localities, the highs were Abu Ghosh (14,986.6 NIS/student),

Kfar Bara (14,437.3 NIS/student), and Peki'in (14,405.6 NIS/student) and the lows were Tel Sheva (1,654.0 NIS/student), Kuseife (2,360.0 NIS/student), and Laqiya (2,562.0 NIS/student) all of which are Muslim majority. In 2008, the highest Arab allotment was 6,853.5 NIS/student and the highest Jewish allotment was 16,037.8 NIS/student, which both increased by 216% and 85% respectively by 2018. The high end of the Arab range showed the most change over the 11 years, which is consistent with the findings from the averages. However, focusing on the lows and highs with the Arab category does not illuminate the Druze and their substantial role in hiking up the Arab general average over time. Thus, accurate to the hypotheses, this variable demonstrates variation across the Jewish/Arab binary as well as within the Arab subcategories.

Total Expenses for Education through Time

Similar to employment expenses, total expenses also exhibit an upward trend across all communities (Figure 6). However, even with Arab increase, there continues to be a large difference between the spending of majority and minority demographic populations. Once again, Muslim and Druze localities just about doubled expenses from 2008 to 2018, whereas Jewish localities increased by 77%. All three subgroups of Arab populations exceeded the Jewish starting point in 2008 (8,483.6 NIS/student), but none are close to catching Jewish average spending in 2018. Expense averages reveal new instances of existing trends, like general upward momentum and hearty Arab increase. However, when comparing total spending to employment spending, Druze and Jewish localities appear to spend the budget allotments differently.

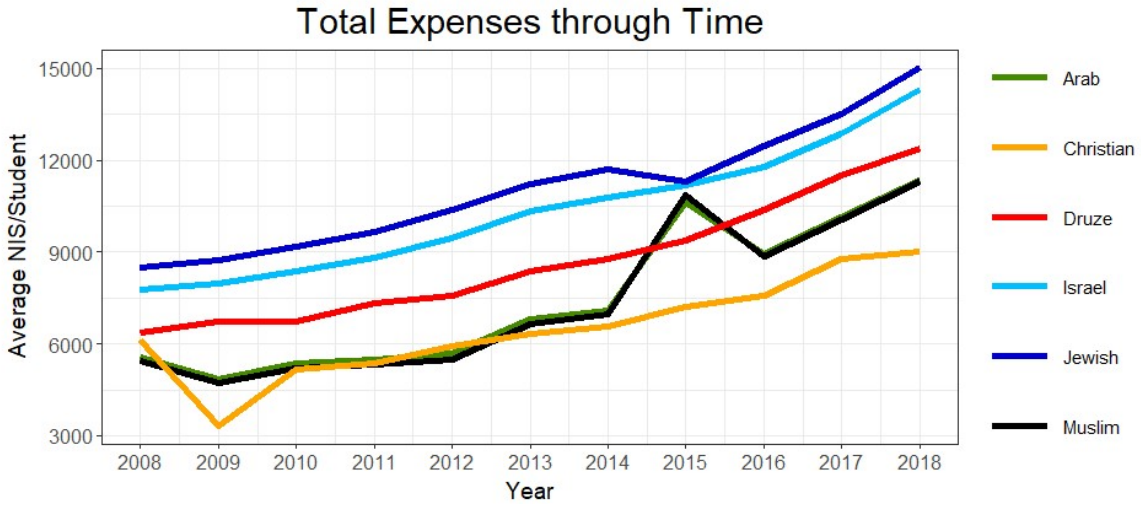

Figure 8: Total Expenses for Education through Time

On average, Jews use a smaller portion of their expenses for employment compared to Arab populations. Additionally, over time, Jewish communities use about the same proportion between employment and other expenses, whereas Arab communities have significantly increased the portion allotted for employment. In 2008, Jewish communities focused about 49% of their expenses on employment, and in 2018, about 48%. For the Druze population, chosen because of their outstanding increase in Figure 7, the percentage of expenses channeled into education rose from 51% to 59%. Prioritizing employment in Arab communities makes sense, as minority districts have infamously been prevented from bare-minimum educational amenities. In other words, Jewish communities do not focus the majority of spending on employment because they already have those needs met, whereas Arab areas historically have not. Thus, the Jewish budget likely can fund other projects and resources outside of the basic necessities (i.e. teachers).

Examining the individual localities supports these findings, where Jewish localities have a much higher range of total expenditure compared to Arab localities, excluding outliers. However, Arab localities spend a greater proportion of the budget on employment and have

continued to increase that portion since 2008. In 2018, the highest three Jewish localities for total expenditure were Tamar (94,108.3 NIS/student), Mevo'ot HaHermon (84,247.7 NIS/student), and Aravot HaYarden (51,251.7 NIS/student), whereas Arab communities were Kfar Bara (25,573.8 NIS/student), Abu Ghosh (23,295.8 NIS/student), and Neve Midbar (20,173.5 NIS/student). The lows for each of these localities (both Jewish and Arab) were all consistently between 3,200 NIS/student and 5,100 NIS/student. However, the highest Jewish localities used respectively 66%, 35%, and 21% of the total expenses on employment, while the highest Arab localities used 56%, 64%, and 25% respectively. To compare to 2008, the Jewish locality with the highest total expenditure (Aravot HaYarden) used 21% of those expenses for employment, while the highest Arab locality used 22% (Bnei Shimon). While these individual locations show much more variation than the sweeping, average trends, the data still shows that Jewish localities spend much more money, and over time, Arab communities have more extremely increased their portion of expenses on educational employment. For both sets of expense data, the obvious differences in Arab and Jewish expense allotment demonstrates the variation predicted by the hypotheses.

Overall, observing test scores and budget variables over time yields a notable amount of variation – the first step in the process to determine whether the two factors unveil an interesting relationship. In organizing the data by demographic information, the research establishes the similarities and differences across ethnic communities. Regarding the Bagrut, certifications are increasing across the board, but achievement gaps still exist for most Arabs on the standard Bagrut and for all Arabs on the university eligible Bagrut. Gathered from the revenue budget data, the Ministry of Education seems to be compensating intentionally or otherwise for the lack of equality within internal revenue, the only category without an exhaustive upward trend.

Furthermore, within the expenses section, comparing total values to employment values revealed that even with similar rising patterns between Jewish and Arab localities, the two communities appear to spend money differently. Lastly, comparing each of the ethnic groups in summary, the data suggested across most variables the Druze show the most consistent growth, even to the point of surpassing Jewish averages. Ascertaining variation through this time-series now opens up to the next stage of analysis: visualizing correlation.

Relationships between Budget and Bagrut Test Scores

The following graphs (Figures 9, 10, 11, and 12) visually indicate the existence of a positive correlation between the independent budget and dependent test score variables, irrespective of year and demographics. The positive correlation is represented by the upward sloping regression line, indicating that as budget increases, so do test scores. This remained true for all of the following relationships: Internal Revenue for Education and Standard Bagrut Certificates, Internal Revenue for Education and University Bagrut Certificates, Total Revenue for Education and Standard Bagrut Certificates, Total Revenue for Education and University Bagrut Certificates, Employment Expenses for Education and Standard Bagrut Certificates, Employment Expenses for Education and University Bagrut Certificates, Total Expenses for Education and Standard Bagrut Certificates, and Total Expenses for Education and University Bagrut Certificates. Through surface-level observation on correlation, these graphs suggest that the hypotheses are correct –budget and test scores have a positive relationship.

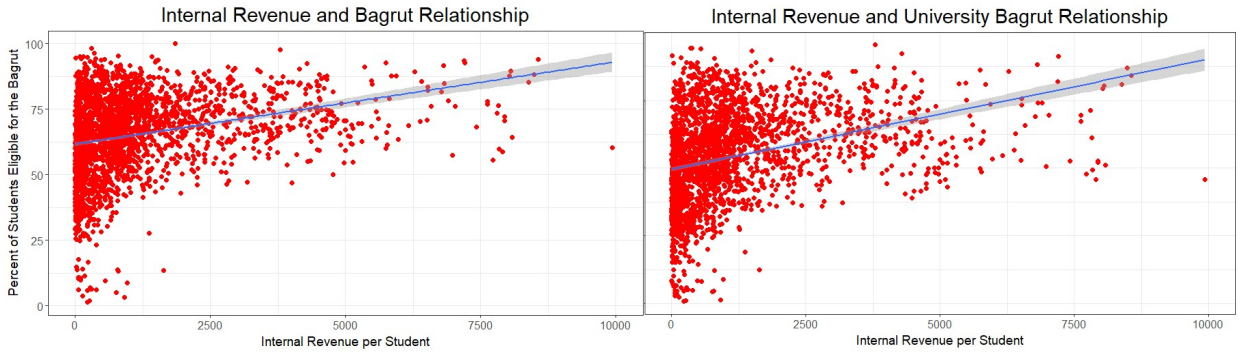

Figure 9: Internal Revenue in Education and Bagrut Relationships

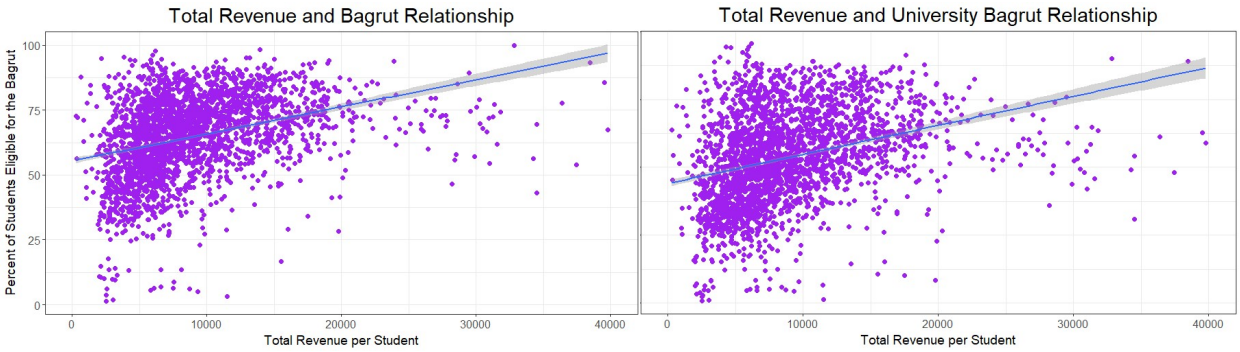

Figure 10: Total Revenue in Education and Bagrut Relationships

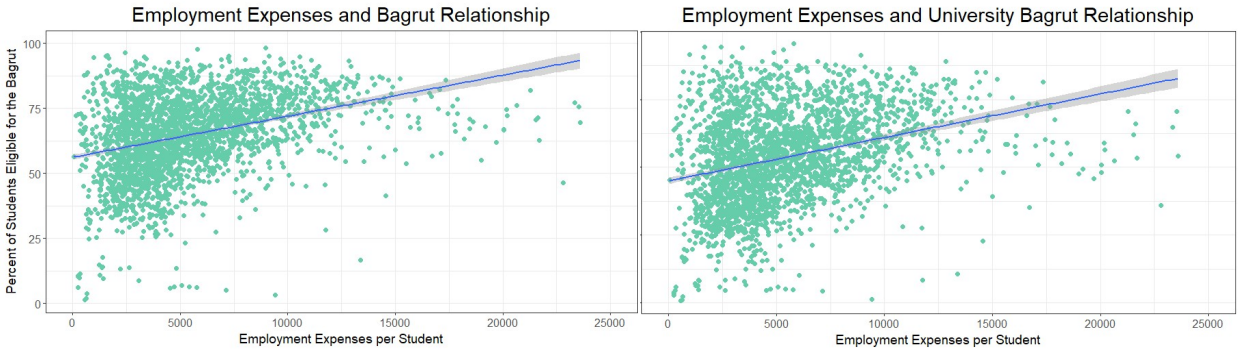

Figure 11: Employment Expenses in Education and Bagrut Relationships

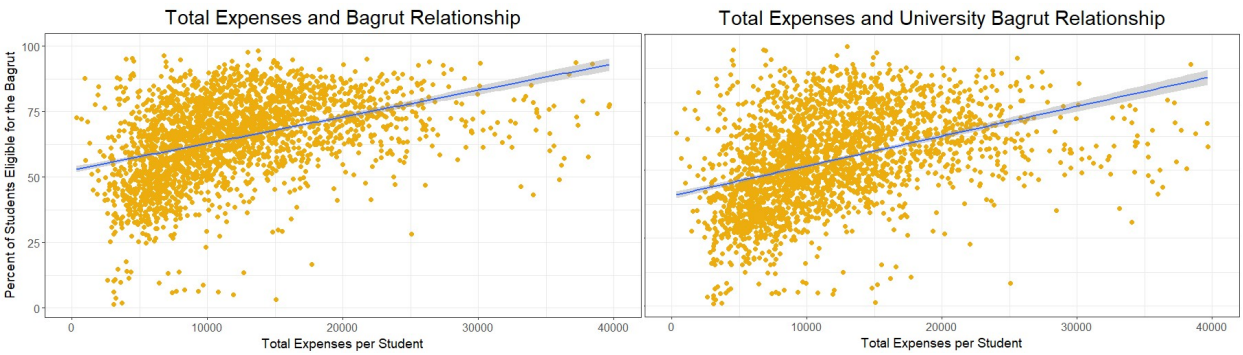

Figure 12: Total Expenses in Education and Bagrut Relationships

While the correlation is clear through these visual representations, there is no way to tell the more intricate facets of the variable relationships. Therefore, visualizing the data in this way encourages an exploration of what statistics may further reveal about the variable relationships between the levels of independent and dependent variables.

Statistical Analysis

Correlation Significance

As clearly displayed in Table 1, the relationships between budget and standard Bagrut results all have positive, linear correlations, representing a relationship between the variables. This conclusion is consistent with one of the elements present in each of my eight alternative hypotheses: "If you increase the [budget variable] in a particular municipality, then the [test score data] in that municipality will increase as well" (Table 1). Furthermore, even with a critical value corresponding to $\alpha \leq 0.01$, all of the coefficients qualify as being statistically significant. In this table, each of the coefficients falls somewhere within the +0.11 to +0.49 range. Consequently, all correlations represent the positive relationship seen earlier in the scatter plots. All of the calculated p-values fell below 0.01, with the exception of internal revenue with Arab schools ($p \leq 0.05$) and internal revenue with Druze schools ($p > 0.1$, not statistically significant). All elements considered, the results between budget and standard Bagrut scores yield a statistically significant, positive correlation. Therefore, I comfortably reject the null hypothesis and argue that the two variables have a positive relationship.

Table 1. Analysis of correlation between budgets and Bagrut certificates

Independent Variable	Model 1	Model 2	Model 3	Model 4	Model 5
Internal Revenue/Student	+0.29	+0.21	+0.09*	+0.11	..
Total revenue for Education/Student	+0.26	+0.21	+0.17	+0.13	+0.46
Expenses for Employing People in Education/Student	+0.28	+0.25	+0.24	+0.19	+0.48
Total Education Expense/Student	+0.29	+0.21	+0.20	+0.16	+0.49

N=2457-2566. Notes: Significance was calculated at $p \leq 0.01$. *- $p < 0.05$. **- $p < 0.1$.

Model 1: Israel
Model 2: Jewish schools
Model 3: Arab schools
Model 4: Muslim and Christian schools
Model 5: Druze schools

Similarly, the relationships between budget and university eligible test scores also seem to be positively correlated across the board (Table 2). This conclusion is also consistent with my hypotheses about university Bagrut results: "If you increase the [budget variable] in a particular municipality, then the [test score data] in that municipality will increase as well." Additionally, like the previous set of statistics, all but one coefficient exhibited statistical significance ($\alpha \leq 0.01$). In these results, the correlation coefficient range was slightly larger than the standard Bagrut, ranging from +0.1 to +0.56. Once again, this range is consistent with the visualized data from the previous section. For p-values, only the relationship between Internal Revenue and the Druze population was not below 0.01, which coordinated with the findings in the previous paragraph. As a result of these conclusions, the relationship between budget and university eligible Bagrut scores also have a positive, statistically significant correlation. Consequently,

with confidence I reject the null hypothesis and argue these two variables also have a positive relationship.

Table 2: Analysis of correlation between budgets and college eligible Bagrut certificates

Independent Variable	Model 1	Model 2	Model 3	Model 4	Model 5
Internal Revenue/Student	+0.33	+0.22	+0.12	+0.13	..
Total revenue for Education/Student	+0.25	+0.19	+0.15	+0.10	+0.51
Expenses for Employing People in Education/Student	+0.26	+0.21	+0.23	+0.16	+0.54
Total Education Expense/Student	+0.29	+0.19	+0.19	+0.14	+0.56

N=2455-2563. Notes: Significance was calculated at $p \leq 0.01$. *- $p < 0.05$. **- $p < 0.1$.

Model 1: Israel
Model 2: Jewish schools
Model 3: Arab schools
Model 4: Muslim and Christian schools
Model 5: Druze schools

Varying Effects of Budget on Test Scores

When directly comparing the independent variables against each other, educational expenses seemed to hold much stronger correlations with standard Bagrut certificates than educational revenue. Specifically, the data show that expenses for employment have the most impact on the rate of standard Bagrut achievement followed by total expenses in education, internal revenue, and total revenue in order. Expenses in educational employment had the strongest correlation in three of the five models, with the other two being second strongest. Total expenses was similar, though slightly less strong across the board, with the strongest correlation in two models, and second strongest in three. Internal revenue came next as the strongest in one model and the weakest in three. Lastly, total revenue was strongest in none of the models,

indicating the lowest weakest correlation. When comparing these correlations against the internal versus external financial source model, the three measures of internal management had a stronger impact on standard Bagrut scores compared to the measure of external aid. Furthermore, the much greater impact from educational expenses indicate that the management of funds within a locality may be the most significant factor towards improving standard test scores, which is consistent with Zeedan et al.'s (2017) findings as well.

Comparing the results across budget variables yielded the same result in the university eligible data: expenses for employment hold the most influence. Once again, the descending order is then total education expenses, internal revenue, and much further below is total revenue. Expenses for employment was strongest in three models, second strongest in one, and third strongest in another. Total expenses was close behind as the strongest in one model, second in three models, and third in one model. Internal revenue trailed much more closely behind compared to the standard Bagrut as the strongest in two models, the third in one, and the weakest in one. Trailing far behind is total revenue, which was weakest in four of the five models. Once again, when looking at these levels of the independent variable as internal versus external, the three internal management variables had overall stronger correlations to university eligible Bagrut scores than the external aid variable. However, in this case, expenses did not hold as big of a weight over internal revenue as there was in the standard Bagrut; though the order of variable strength stayed the same, the top three were much closer. Similar to the previous data, these results support Zeedan et al.'s (2017) model.

Controlling for Demographics

Looking individually into each of the demographic categories (control variables) in this research project demonstrates that each group had higher and lower correlations with different

independent variables. Additionally, the data demonstrated changes in these rankings between standard and university eligible Bagrut certificates. For example, the highest Druze coefficient was for total expenses and the highest Muslim/Christian coefficient was employment expenses in both standard and university Bagrut relationships. For the Jewish community, however, expenses in employment had the highest correlation for the standard Bagrut, but internal revenue had the highest for university eligibility. Lastly, general Israel had high coefficients in both total expenses and internal revenue for the standard Bagrut, but only internal revenue for the university certificate. Collectively, Arab communities exhaustively had their individual highest correlations in expense categories. Meanwhile, Jewish communities and Israel at large both had higher expense coefficients for the standard Bagrut but then relied heavier on internal revenue at the university level.

Directly comparing and contrasting across all communities suggests that the Druze community had the strongest correlation between the independent and dependent variables. Not only were those coefficients the strongest across all statistically significant independent variables, but they also extended through both standard and university eligible Bagrut data. With coefficients between +0.46 and +0.56 at all times, the Druze demographic category was the only one to exhibit a moderate level of correlation; all other ethnic communities had low correlation. In order of correlation strength, after the Druze followed general Israeli, Jewish, general Arab, and Muslim/Christian communities in descending order. Considering the order of correlation strength, the Druze community is more likely to see consistent increases in test scores as budget factors increase. While they stand apart from other communities with higher correlation coefficients, considering the entire Arab community addresses the predictions from the original hypotheses.

In the second half of each hypothesis in Appendix A, Table A1, I discussed the different correlations with potential prevalence in the final data; post analysis, five of the eight were incorrect. Under the umbrella of standard Bagrut results, I predicted Jewish communities would have higher correlations in total revenue (external financial factors), and Arab communities would have higher correlations in internal revenue, employment expenses, and total expenses (internal financial factors). However, the correlations were higher for Jews across all categories. The correlations were basically the same in employment expenses (+0.25 Jewish vs. +0.24 Arab) and total expenses (+0.21 Jewish vs. +0.20 Arab), but internal revenue and total revenue had much bigger gaps. For total revenue, Jewish districts had +0.21 versus the Arab +0.17, and, as the biggest difference, in internal revenue, Jewish communities had +0.21 versus the Arab +0.09. While I had predicted internal management would be stronger for Arab schools, Jewish communities had stronger correlations in all areas. Therefore, budget (and particularly revenue) is less of a predictor for general Arab achievement (again, recognizing the Druze stand apart) than for Jewish achievement on receiving standard Bagrut certifications.

Likewise, for the university eligible certificate, half of the hypotheses were incorrect. I had predicted once again total revenue would be a greater indicator for Jewish localities than Arab localities, while the others would be greater indicators for Arabs. However, both revenues were once again a higher correlation set for Jews than Arabs, but employment expenses were higher for Arabs. Total expenses were consistent across both groups at +0.19. Additionally, both revenue categories were higher for Jewish authorities with internal revenue having a Jewish coefficient of +0.22 and an Arab coefficient of +0.12 and total revenue having +0.19 and +0.15 respectively. For the first time across this comparison, however, employment expense coefficients were higher in Arab communities at +0.23 versus +0.21. These results both

entrenched previous findings from the standard Bagrut and introduced new considerations. Revenue across the board seems to be dominated by higher Jewish coefficients compared to general Arab ones. However, for university eligible Bagrut, Arabs have a higher coefficient for employment expenses, suggesting that this variable may be the most solid predictor for general Arab advanced test scores.

Overview of Key Points

Considering the amount of ground we covered in this section, for the sake of palatability, this paragraph boils everything down to ten key discoveries:

1) There is an across-the-board increase in both standard and university eligible test scores from 2008 to 2018.

2) The only variables where all 2018 Arab averages have not exceeded 2008 Jewish averages is internal revenue and university eligible Bagrut certificates. This represents a persisting, large disparity between Arab and Jewish schools.

3) The only variable with no upward trend through time and has a persisting, substantial gap between Jewish and Arab localities is internal revenue.

4) Total revenue has been equalized over time through all demographic categories, indicating that the Ministry of Education is adjusting budget allocation to neutralize the gap from differences in internal revenue.

5) Over time, the Druze communities stand apart from other Arabs in standard Bagrut achievement and expenses in employment, even to the point of surpassing current Jewish averages.

6) There is a positive, linear correlation for all of the following relationships:

    a. Internal Revenue for Education and Standard Bagrut Certificates
    b. Internal Revenue for Education and University Bagrut Certificates
    c. Total Revenue for Education and Standard Bagrut Certificates
    d. Total Revenue for Education and University Bagrut Certificates
    e. Employment Expenses for Education and Standard Bagrut Certificates
    f. Employment Expenses for Education and University Bagrut Certificates
    g. Total Expenses for Education and Standard Bagrut Certificates
    h. Total Expenses for Education and University Bagrut Certificates

7) Expenses for Educational Employment are consistently the most impactful independent variable across all demographic categories in both standard and university eligible Bagrut environments.

8) Internal measures of finance were more strongly correlated with test score increase than the external measure in both standard and university eligible Bagrut environments.

9) The highest Arab correlations were in expenses, while the Jewish correlations corresponded highest with expenses in the standard Bagrut but switched to internal revenue for the university eligible Bagrut.

10) The Druze had the highest correlations across the board, but when comparing Jewish communities to all Arab communities as a whole, Jews had the higher correlations.

Overall, this research has identified a positive relationship between budget allocation and test scores. Therefore, on the basis of statistically significant correlation, I reject the possibility of no relationship between the two, thereby supporting the first part of each hypothesis. Additionally, trends between internal and external financial variables within education demonstrate that internal variables having the strongest correlations. However, these trends did not manifest through the strength of correlations the way the hypotheses predicted. Nevertheless, within a ranking system between the actual measures of dependent variables, findings do open up significant discussion for the application of Zeedan et al.'s (2017) model.

Discussion and Conclusion

An established, positive relationship between budget and test scores is not a claim free from disagreement or controversy. Both the academic community and the general population regard this relationship with caution, recognizing the inconsistent findings across many school systems in the Western, developed world. Nevertheless, this research contributes to existing academic literature by claiming, at least in the case of Israel, money does improve test scores. In examining 40 different scenarios, using four different measures of budget variables, controlling for five different demographic classifications, including two tiers of test scores, and spanning 11

years of data, this research found that 38 of those scenarios yielded positive, statistically significant correlations between budget and test scores. Therefore, in contrast to Hanushek (2010, as cited in Cobb-Clark & Jha, 2016) who claims, "it is not that school's resources never matter, but rather that there does not seem to be any systematic relationship between resources and educational outcomes" (p. 260), this project uncovers a systematic relationship between monetary resources and educational outcomes. To be fair, this paper examines Israel, which the academic community has not yet discussed in relation to budgets and test scores. Nevertheless, according to the findings within this paper, the academic world should not close its doors so quickly on the role of budget in educational outcomes or inequality.

Additionally, in literature, this project contributes to the governmental funding and expenses debate on improving student achievement. For the most part, the conclusions drawn above challenge previous findings. First, Garcia et al. (2015) and Ladd et al. (2014) ruled in favor of governmental support as a variable making sizable difference in student achievement; while the data from Israel confirm a positive correlation with central governmental allocation, this measure of budget was far from being the most impactful factor. Furthermore, Cobb-Clark and Jha (2016) found that funding did not make a notable difference on test scores – another conclusion these findings challenge. Lastly, regarding expenses, both Lee and Polachek (2018) and Cobb-Clark and Jha (2016) concluded that this measure of financial data did not make a difference on test scores; however, this research argues that, in the case of Israel, these conclusions do not hold true. Thus, the expansion of this research question into a new geographic location and recontextualizes funding and expenses. In future research, academia should further explore the role of budget in test scores before too hastily discounting it solely on the basis of studies from the Anglosphere.

Regarding the examination of budgets in the realm of education, however, this paper uncovers the potential usefulness of Zeedan et al.'s (2017) model for understanding the nuance within monetary allotment. In using this theory within the analysis, this project not only looks at the general impact of budget, but further parses down different financial measurements in order to understand where the outcome is actually coming from. Expanding the internal management and external support classification from Zeedan et al. (2017) into the educational field, this study found that internal budget factors (internal revenue, expenses for employment, and total expenses) were more impactful in every demographic category and across both tiers of Bagrut data. This discovery is consistent with the original findings produced by the model, where the "'local management approach' more often explains a financial crisis" (p. 1065). However, in our case, the claim may very well be that the "local management approach" more often explains educational improvement. Therefore, in using this theory, this paper clarifies the aspects of budget exhibiting the most relevant effects on test scores. Whereas most people debate over "government funding" in regard to budgets, the dialogue should shift away from exclusively talking about external factors.

Concerning trends in Israel, this research also provides an up-to-date view on the level of disparity in Jewish and Israeli education. While there is plenty of discussion in previous literature about Israel's status, this paper draws conclusions entirely from the most recent, available data as of 2021. Therefore, the data provide the most currently updated picture for the ethnic achievement gap. First, test scores and budget allocation continue to increase for Arab communities over time, which does reflect at least surface-level positivity on the current efforts of the Ministry of Education to decrease the achievement gap. Along the same line, the increase in focus from the Ministry of Education does imply that Decision No., 1060 and Resolution 922

are, in fact, doing what they intended to do: increase funding to Arab localities. However, a substantial disparity still exists between Arabs and Jews in internal revenue and university eligible Bagrut scores. The literature recognizes internal revenue differences between Jewish and Arab localities (Zeedan et al., 2017; Halabi, 2014), but academia has not discussed university eligible Bagrut scores. While these trends are only two of the eight examined in this research, they pose significant questions: is the gap in internal revenue a representation of neglect for Arab communities in other areas such as socioeconomics, employment, and sense of belonging and community? If the education system still has a substantial achievement gap in university eligible Bagrut certificates, why is it so infrequently addressed, considering these outcomes have the power to bar minority groups from higher education and, therefore, higher employment and salary opportunities? Evidently, amongst the improvement and apparent governmental effort, Israeli education still has inequalities running deeply through the system, possibly representing bigger issues of Arab neglect or discrimination in Israel.

In addition to these more nefarious implications and potential inequity, this research also found patterns for budget factors that may actually make a difference for an unjust system: expenses for employment. By examining the budget variables with a stronger correlation, particularly in the case of the Druze, further research will soon have room to verify factors for positive change within Israeli education. Consistently across budget factors and tiers of testing data, expenses for employment within education had the highest correlations. Particularly, within the Druze community, undoubtedly making the most astonishing improvements and having the highest correlations of all ethnic categories in Israel, they seemed to have made effective use of expenditures. Of all the demographic categories, the Druze localities increased their employment spending the most from 2008 to 2018, ultimately passing the Jewish average. Not surprisingly,

the Druze also yielded the most substantial increases in Bagrut test scores, even eventually exceeding Jewish standard Bagrut averages. Since expenses correlated so significantly with test scores for the Druze who made the most intentional expenditure alterations out of all of the other groups, policy and future research may want to consider examining the use of expenditure, particularly when used for employment.

Speaking of policy, using the general Israeli trends and this project's expansion on literature, the most practical policy implications would be encouraging local management, as is consistent with the policy implications from Zeedan et al. (2017). This research agrees with their policy suggestions but proposes slight variations to adapt to the specific needs of the education system. The 2017 study's policies call for eventual local independence and sustainability in financial management by way of temporary funding increases from the central government, greater supervision over local financial management, and incentives for improvement. Likewise, according to my study, while funding from the central government is certainly helpful (manifested by positive correlation) and should continue to account for local inequity, it seems the biggest effect comes from where the money goes once reaching a locality. Using expenses in education as the main influence over student achievement implies that governmental policy should be tailored for the enrichment and support of local education rather than central control and permanent dependability. As such, policy should encourage continued central funding for the promotion of sustainability and equity, while using training for local administration as a replacement for incentives and supervision. Therefore, by improving local management and continually providing equitable governmental aid, struggling localities would have the best chance at improving the apportionment of their expenditures, which should highly correspond with growth in test scores.

Future research along this topic of discovery can both correct the current limits within the data and further scrutinize the findings within Israel (including expanding the focus on test preparation). Furthermore, projects stemming from this paper could expand the findings to other locations to see if the structure of education systems within a nation can alter the conclusion. First, exploring the role of expenses within Israeli education would be a worthwhile expansion of this project, particularly for policy implications. To circumvent this paper's limits, future research could add additional measures of budget variables, enriching the conclusions from this paper for the role of expenditure, strengthening the validity of Zeedan et al.'s (2017) model by adding more internal/external distinction, and retrieving Bagrut data with existing averages or moldable raw data. Second, as previously mentioned, research on test preparation and resources is a growing dialogue; by understanding that local management of resources could be a strong factor in test scores, tracking money in test prep (materials, teacher training, availability of extra classes) would contribute to that body of literature. Third, different nations have different structures of educational systems. Israel's is fairly simple, with the small geographic size and the division of power falling between only central and local powers. In places like the United States, however, where there is vast variation across immense geographic size and the division of power falling to federal, state, and local influences, there could be different results for expenditure data. Looking further into the role of expenditure could open a new dialogue within academia and the way the community views budget as a way to influence educational achievement.

Considering the unique history and current status, Israel serves as an effective case study to observe how a country built on separation and tension quickly tries to adapt to a global atmosphere progressively becoming more concerned with equity. Just 73 short years ago, the Israeli government came into existence following a tragic series of ethnic disagreements, riots,

and wars. Now, only about 50 years since the last Arab war, about 21 years since a failed major peace process, and only about 16 years since the second Intifada, the state of Israel must care for, equitably support, fund, and ensure the success of the very people they fought against. There is a long way to go before that expectation will meet full realization. While the pressure on Israel is high for such a young nation, as members of the academic community, it is our job to hold national policies and systems to standards of critical evaluation; for the protection, equal opportunity, visibility, and success of minority communities, this dialogue circulates the necessary data to hold the nation-state accountable for their policies, whether successful or full of oversights.

References

Abu-Saad, I. (2003). The role of education in minority identity formation in an ethnic state: The case of Palestinian Arab youth in Southern Israel. *The Arab Studies Journal, 11/12*(2/1), 57–75.

Abu-Saad, I., & Champagne, D. (2006). Introduction: A Historical Context of Palestinian Arab Education. *The American Behavioral Scientist (Beverly Hills)*, *49*(8), 1035–1051. https://doi.org/10.1177/0002764205284717

Adalah. (2010). *On the Israel government's new decision classifying communities as National Priority Areas*. https://www.adalah.org.

Alexander, M. (2019, January 19). Time to break the silence on Palestine. *The New York Times*. https://www.nytimes.com/2019/01/19/opinion/sunday/martin-luther-king-palestine-israel.html

Alon, S. (2010). Racial differences in test preparation strategies. *Social Forces, 89*(2), 463-474. https://doi-org.www2.lib.ku.edu/10.1353/sof.2010.0053

Arar, K., Haj-Yehia, K., & Badarneh, A. (2016). Barriers impeding access to higher education: The effects of government education policy for disadvantaged Palestinian Arab and Jewish citizens. In *Widening Higher Education Participation* (pp. 81–98). Chandos Publishing.

Ayalon, H., & Gamoran, A. (2000). Stratification in academic secondary programs and educational inequality in Israel and the United States. *Comparative Education Review, 44*(1), 54-80.

Ayalon, H., & Shavit, Y. (2004). Educational reforms and inequalities in Israel: The MMI Hypothesis revisited. *Sociology of Education, 77*(2), 103-120.

Azen, R., Bronner, S., & Gafni, N. (2002). Examination of gender bias in university admissions. *Applied Measurement in Education, 15*(1), 75-94.

Ball, S. J. (2017). *The education debate (Third Edition)*. Policy Press. http://ebookcentral.proquest.com/lib/ku/detail.action?docID=4983219

Bar-Tal, D., & Salomon, G. (2006). Israeli-Jewish narratives of the Israeli Palestinian Conflict: Evolvement, contents, functions and consequences. In R.I. Rotberg (Ed.), *Israeli and Palestinian narratives of conflict: History's double helix* (pp. 19-46). Bloomington: Indiana University Press.

BenDavid-Hadar, I. (2018). Funding education: Developing a method of allocation for improvement. *The International Journal of Educational Management, 32*(1), 2-26. doi:http://dx.doi.org.10.1108/IJFM-07-2016-0161

Biçak, B. (2013). Scale for test preparation and test taking strategies. *Educational Sciences: Theory & Practice, 13*(1), 279-289.

Bickerton, I. J., & Klausner, C. L. (2018). *A history of the Arab–Israeli conflict.* Routledge.

Bigelow, B. (2014). Chapter 17: Standards and tests attack multiculturalism. In W. Au (Ed), *Rethinking multicultural education* (2nd ed., pp. 127-134). Rethinking Schools.

Boger, J.C. (2003). Education's ''perfect storm''? Racial resegregation, high stakes testing, and school resource inequities: The case of North Carolina. *North Carolina Law Review, 81*,1375-1462.

Brookover, W.B. (1985). Can we make schools effective for minority students? *The Journal of Negro Education, 53*(3), 257-268.

Brunn-Bevel, R., Byrd, W., Seamster, L., & Henricks, K. (2015). The foundation of racial disparities in the standardized testing era: The impact of school segregation and the assault on public education in Virginia. *Humanity & Society, 39*(4), 419-448.

Central Bureau of Statistics (CBS). (2018a). Introduction – General; main findings; terms; definitions and explanations; sources; methods [PDF]. In *Local Authorities in Israel*, 2018 (pp. 9-86). https://www.cbs.gov.il/he/publications/doclib/2020/local_authorities18_1797/intro_h.pdf

Central Bureau of Statistics (CBS). (2018b). *Local Authority Data* [Excel Spreadsheet]. https://www.cbs.gov.il/he/publications/Pages/2020/%D7%94%D7%A8%D7%A9%D7%95%D7%99%D7%95%D7%AA-%D7%94%D7%9E%D7%A7%D7%95%D7%9E%D7%99%D7%95%D7%AA-%D7%91%D7%99%D7%A9%D7%A8%D7%90%D7%9C-2018.aspx

Dadon-Golan, Z., BenDavid-Hadar, I., & Klein, J. (2019). Equity in education: The Israeli case. *International Journal of Educational Management, 33*(7), 1670-1685.

Dror, Y. (2007). The history of Israeli non-formal education, 1920-2000: Dimensions drawn from the past. *Israel Studies Forum, 22*(1), 75-99.

Eagle, E. (1989). *Socio-economic status, family structure, and parental involvement: Correlates of achievement* [Conference paper]. Annual Meeting of the American Education Research Association, San Francisco, CA, United States.

Ebenstein, A., Lavy, V., & Roth, S. (2016). The long-run economic consequences of high-stakes examinations: Evidence from transitory variation in pollution. *American Economic Journal. Applied Economics, 8*(4), 36-65.

Eisikovitz, R. (1997). The educational experience and performance of immigrant and minority students in Israel. *Anthropology and Education Quarterly, 28*(3).

Elboim-Dror, R. (2000). British educational policies in Palestine. *Middle Eastern Studies, 36*(2), 28-47.

Elran, M., Nasra, M. A., Yashiv, E., & Abu, M. INSS Insight No. 993, November 22, 2017 Two Years into the Five-Year Plan for Economic Development of the Arabs in Israel.

Fried, M. N., Perl, H., & Arcavi, A. (2018). Highlights in the Development of Education and Mathematics Education in the State of Israel: A Timeline. *K-12 Mathematics Education in Israel: Issues And Innovations*, *13*, 3-19.

Garcia, C., Jones, D., & Isaacson, C. (2015). Comparing state mandated test scores for students in programs with and without fine arts in the curriculum. *Journal of Case Studies in Education, 7*.

Gelvin, J. L. (2014). *The Israel-Palestine conflict: One hundred years of war (3rd ed.)*. Cambridge University Press.

Grodsky, E. (2010). Learning in the shadows and in the light of day. *Social Forces, 89*(2), 475-481.

Halabi, Y. (2014). Democracy, Clan Politics and Weak Governance: The Case of the Arab Municipalities in Israel. *Israel Studies*, *19*(1), 98–125. https://doi.org/10.2979/israelstudies.19.1.98

Jencks, C., & Phillips, M. (2011). *The Black-White test score gap*. Brookings Institution Press

Kamenetz, A. (2015) *The Test : Why Our Schools are Obsessed with Standardized Testing: But You Don't Have to Be.* PublicAffairs. http://ebookcentral.proquest.com/lib/ku/detail.action?docID=1771941

Katz, Y. (2007). Education for peaceful coexistence in the Israeli State Jewish school system. *Peace or violence: The ends of religion and education?* 195-207.

Katz, Y. (2010). The state approach to Jewish and non-Jewish education in Israel. *Comparative Education, 46*(3), 325–338.

Ladd, H., Muschkin, C., & Dodge, K. (2014). From birth to school: Early childhood initiatives and third-grade outcomes in North Carolina. Journal of Policy Analysis and Management, 33(1), 162-187. https://doi.org/10.1002/pam.21734

Lavy, V. (1998). Disparities between Arabs and Jews in school resources and student achievement in Israel. *Economic Development and Cultural Change, 47*(1), 175-192.

Lee, K. G., & Polachek, S. W. (2018). Do school budgets matter? The effect of budget referenda on student dropout rates. *Education Economics*, *26*(2), 129-144.

Lewis-McCoy, R. L. (2014). *Inequality in the promised land: Race, resources, and suburban schooling.* Stanford University Press.

Molcho, A. (2010). The formation of secondary education in Israel, 1948-1964. *Journal of Israeli History, 29*(1), 25-45.

Morris, B. (2007). Revisiting the Palestinian exodus of 1948. In E.L. Rogan & A. Shlaim (Eds.), *The war for Palestine: Rewriting the history of 1948* (pp. 37-59). Cambridge University Press.

Parker, F. (1981). The problems of educating Israel's Arabs. *The Phi Delta Kappan, 62*(10), 712–713.

Pike, G. (2000). Global education and national identity: In pursuit of meaning. *Theory Into Practice, 39*(2), 64. https://doi-org.www2.lib.ku.edu/10.1207/s15430421tip3902_2

Raichel, N., & Tadmor-Shimony, T. (2014). Jewish Philanthropy, Zionist Culture, and the Civilizing Mission of Hebrew Education. *Modern Judaism*, *34*(1), 60–85. https://doi.org/10.1093/mj/kjt020

Rotberg, R. (Ed.). (2006). *Israeli and Palestinian narratives of conflict: History's double helix*. Indiana University Press.

Shapira, A. (2012). *Israel: A history* (1st ed.). University Press of New England.

Shohamy, E. (2006). *Language Policy: Hidden Agendas and New Approaches*. Routledge. https://doi.org/10.4324/9780203387962

Smith, W. C. (2014). The global transformation toward testing for accountability. *Education Policy Analysis Archives, 22*(116). http://dx.doi.org/10.14507/epaa.v22.1571

Zeedan, R., Vigoda-Gadot, E., Ben-Artzi, Y. (2017). Causes of (and solutions for?) financial crises in local governments: Insights from local Arab authorities in Israel. Administration & Society, 49(7), 1065-1083. https://doi.org/10.1177/0095399714556501

Zuzovsky, R. (2008). Closing achievement gaps between Hebrew-speaking and Arabic-speaking students in Israel: Findings from TIMSS-2003. *Studies in Educational Evaluation, 34*(2), 105-117.

Appendix A

Table A1: Hypotheses

Level of I.V.	Level of D.V.	Hypothesis
Internal Revenue (Internal)	Bagrut Certificates	If you increase the internal revenue in a particular municipality, then the Bagrut scores in that municipality will increase as well, with Arab results being more correlated than Jewish results.
	University Eligible Bagrut Certificates	If you increase the internal revenue in a particular municipality, then the university eligible Bagrut scores in that municipality will increase as well, with Arab results being more correlated than Jewish results.
Total Revenue (External)	Bagrut Certificates	If you increase the total revenue in a particular municipality, then the Bagrut scores in that municipality will increase as well, with Jewish results being more correlated than Arab results.
	University Eligible Bagrut Certificates	If you increase the total revenue in a particular municipality, then the university eligible Bagrut scores in that municipality will increase as well, with Jewish results being more correlated than Arab results.
Employment Expenses (Internal)	Bagrut Certificates	If you increase the expenses for employment in a particular municipality, then the Bagrut scores in that municipality will increase as well, with Arab results being more correlated than Jewish results.
	University Eligible Bagrut Certificates	If you increase the expenses for employment in a particular municipality, then the university eligible Bagrut scores in that municipality will increase as well, with Arab results being more correlated than Jewish results.
Total Expenses (Internal)	Bagrut Certificates	If you increase the total expenses in a particular municipality, then the Bagrut scores in that municipality will increase as well, with Arab results being more correlated than Jewish results.
	University Eligible Bagrut Certificates	If you increase the total expenses in a particular municipality, then the university eligible Bagrut scores in that municipality will increase as well, with Arab results being more correlated than Jewish results.

Table A2: Variables for this Research

Dependent/ Independent Variables	The Variables	Explanation
Dependent Variables: Student Achievement	A1: Bagrut Certificates (percentage)	A1: Percentage of 12th grade students who receive 20 units and pass matriculation exam
	A2: Bagrut Certificates Eligible for University (percentage)	A2: Percentage of 12th grade students who pass matriculation exam and receive additional credits, qualifying for university enrollment
Independent Variables: Budget Revenue in Education	R1: Internal Revenue per student	R1: Educational income from the local authority that does not come from the national government. Includes all educational fees and donations from local residents. Raw data transformed using number of students in each locality.
	R2: Total Education Allotment per student	R2: Educational income from the Israeli Central Government. Raw data transformed using number of students in each locality
Independent Variables: Budget Expenses in Education	E1: Expenses in Educational Employment per student	E1: Based on financial statements from authorities. Includes wages, overtime, pension, travel allowance, training, etc. Raw data transformed using number of students in each locality
	E2: Total Educational Expenses per student	E2: Based on financial statements from authorities. Could include some teacher salaries, building and equipment maintenance, housekeeping, transportation, security, etc. Raw data transformed using number of students in each locality
Control Variables: Demographics	D1: Jewish Population (percentage)	D1: Percentage of Jews in total locality population.
	D2: Arab Population (percentage)	D2: Percentage of Arabs in total locality population.
	D3: Muslim Population (percentage)	D3: Percentage of Muslims in total locality population.
	D4: Christian Population (percentage)	D4: Percentage of Arab Christians in total locality population.
	D5: Druze Population (percentage)	D5: Percentage of Druze in total locality population.

Note: Explanations (CBS, 2018a)

Appendix B

Data Compilation:

```
=MATCH([cell],'[Thesis Spreadsheet.xlsx]2018'![range],0)
```

Populate New Columns:

```
=IFERROR(([budget variable cell]*1000)/[student number cell], NA())
```

```
=IF(AND([Jewish population cell]=0, [Arab population cell]=0), "",
     IF([Jewish population cell]>50, "Jewish", "Arab"))
```

```
=IF(ISNUMBER(FIND([hidden reference cell],[Jewish/Arab cell])),
     (IF([Muslim population cell]>50,"Muslim",(IF([Christian
     population cell]>50,"Christian", "Druze")))), "")
```

Averages:

```
=AGGREGATE(1,6,[variable range])
```

Correlation Coefficient:

```
=CORREL(Combo![budget variable range],Combo![Bagrut variable range])
```

N:

```
=COUNTIFS(Combo![budget variable range], "<>", Combo![Bagrut variable
     range], "<>")
```

T-Statistic:

```
=([correlation coefficient]*(SQRT([degrees of freedom)))/(SQRT(1-
     ([correlation coefficient]^2)))
```

Degrees of Freedom:

```
=[N]-2
```

P-Value:

```
=TDIST([t-stat],[degrees of freedom],2)
```

Appendix C

```
## Making Graphs for Thesis

    ## Preliminaries

      rm(list = ls())
      getwd()
      setwd("/Users/Owner/Documents/Thesis/")
      list.files()

      library(readxl)
      library(tidyverse)
      library(dplyr)

    ##Reading All Data

      budget <- read_excel("Table.xlsx")

    ##Reading Individual Data Sheets

      #Internal Revenue

      internali <- read_excel("Table.xlsx", "irps_i")
      internali <- tibble::as_tibble(internali)

      internalj <- read_excel("Table.xlsx", "irps_j")
      internalj <- tibble::as_tibble(internalj)

      internala <- read_excel("Table.xlsx", "irps_a")
      internala <- tibble::as_tibble(internala)

      internalm <- read_excel("Table.xlsx", "irps_m")
      internalm <- tibble::as_tibble(internalm)

      internalc <- read_excel("Table.xlsx", "irps_c")
      internalc <- tibble::as_tibble(internalc)

      internald <- read_excel("Table.xlsx", "irps_d")
      internald <- tibble::as_tibble(internald)


      #Total Revenue

      totalri <- read_excel("Table.xlsx", "trps_i")
      totalri <- tibble::as_tibble(totalri)

      totalrj <- read_excel("Table.xlsx", "trps_j")
      totalrj <- tibble::as_tibble(totalrj)

      totalra <- read_excel("Table.xlsx", "trps_a")
      totalra <- tibble::as_tibble(totalra)

      totalrm <- read_excel("Table.xlsx", "trps_m")
      totalrm <- tibble::as_tibble(totalrm)

      totalrc <- read_excel("Table.xlsx", "trps_c")
      totalrc <- tibble::as_tibble(totalrc)

      totalrd <- read_excel("Table.xlsx", "trps_d")
      totalrd <- tibble::as_tibble(totalrd)

      #Expense in Education

      exedi <- read_excel("Table.xlsx", "eeps_i")
      exedi <- tibble::as_tibble(exedi)

      exedj <- read_excel("Table.xlsx", "eeps_j")
      exedj <- tibble::as_tibble(exedj)

      exeda <- read_excel("Table.xlsx", "eeps_a")
```

```
exeda <- tibble::as_tibble(exeda)

exedm <- read_excel("Table.xlsx", "eeps_m")
exedm <- tibble::as_tibble(exedm)

exedc <- read_excel("Table.xlsx", "eeps_c")
exedc <- tibble::as_tibble(exedc)

exedd <- read_excel("Table.xlsx", "eeps_d")
exedd <- tibble::as_tibble(exedd)

# Total Expense

totalexi <- read_excel("Table.xlsx", "teps_i")
totalexi <- tibble::as_tibble(totalexi)

totalexj <- read_excel("Table.xlsx", "teps_j")
totalexj <- tibble::as_tibble(totalexj)

totalexa <- read_excel("Table.xlsx", "teps_a")
totalexa <- tibble::as_tibble(totalexa)

totalexm <- read_excel("Table.xlsx", "teps_m")
totalexm <- tibble::as_tibble(totalexm)

totalexc <- read_excel("Table.xlsx", "teps_c")
totalexc <- tibble::as_tibble(totalexc)

totalexd <- read_excel("Table.xlsx", "teps_d")
totalexd <- tibble::as_tibble(totalexd)

# Bagrut Data

bagruti <- read_excel("Table.xlsx", "bag_i")
bagruti <- tibble::as_tibble(bagruti)

bagrutj <- read_excel("Table.xlsx", "bag_j")
bagrutj <- tibble::as_tibble(bagrutj)

bagruta <- read_excel("Table.xlsx", "bag_a")
bagruta <- tibble::as_tibble(bagruta)

bagrutm <- read_excel("Table.xlsx", "bag_m")
bagrutm <- tibble::as_tibble(bagrutm)

bagrutc <- read_excel("Table.xlsx", "bag_c")
bagrutc <- tibble::as_tibble(bagrutc)

bagrutd <- read_excel("Table.xlsx", "bag_d")
bagrutd <- tibble::as_tibble(bagrutd)

# University Bagrut Data

# Bagrut Data

ubagruti <- read_excel("Table.xlsx", "ubag_i")
ubagruti <- tibble::as_tibble(ubagruti)

ubagrutj <- read_excel("Table.xlsx", "ubag_j")
ubagrutj <- tibble::as_tibble(ubagrutj)

ubagruta <- read_excel("Table.xlsx", "ubag_a")
ubagruta <- tibble::as_tibble(ubagruta)

ubagrutm <- read_excel("Table.xlsx", "ubag_m")
ubagrutm <- tibble::as_tibble(ubagrutm)

ubagrutc <- read_excel("Table.xlsx", "ubag_c")
ubagrutc <- tibble::as_tibble(ubagrutc)

ubagrutd <- read_excel("Table.xlsx", "ubag_d")
```

```
    ubagrutd <- tibble::as_tibble(ubagrutd)

  ## Add a Variable for the Legend

    internali$community <- "Israel"
    internalj$community <- "Jewish"
    internala$community <- "Arab"
    internalm$community <- "Muslim"
    internalc$community <- "Christian"
    internald$community <- "Druze"

    totalri$community <- "Israel"
    totalrj$community <- "Jewish"
    totalra$community <- "Arab"
    totalrm$community <- "Muslim"
    totalrc$community <- "Christian"
    totalrd$community <- "Druze"

    exedi$community <- "Israel"
    exedj$community <- "Jewish"
    exeda$community <- "Arab"
    exedm$community <- "Muslim"
    exedc$community <- "Christian"
    exedd$community <- "Druze"

    totalexi$community <- "Israel"
    totalexj$community <- "Jewish"
    totalexa$community <- "Arab"
    totalexm$community <- "Muslim"
    totalexc$community <- "Christian"
    totalexd$community <- "Druze"

    bagruti$community <- "Israel"
    bagrutj$community <- "Jewish"
    bagruta$community <- "Arab"
    bagrutc$community <- "Christian"
    bagrutm$community <- "Muslim"
    bagrutd$community <- "Druze"

    ubagruti$community <- "Israel"
    ubagrutj$community <- "Jewish"
    ubagruta$community <- "Arab"
    ubagrutm$community <- "Muslim"
    ubagrutc$community <- "Christian"
    ubagrutd$community <- "Druze"

  ## Graphing

    # Internal Revenue
    ggplot(budget, aes(x = year, y = average, color = community)) +
      geom_line(data = internali, size = 2) +
      geom_line(data = internalj, size = 2) +
      geom_line(data = internala, size = 2) +
      geom_line(data = internalm, size = 2) +
      geom_line(data = internalc, size = 2) +
      geom_line(data = internald, size = 2) +
      theme_bw() +
      scale_color_manual(values=c("chartreuse4", "orange", "red", "deepskyblue", "blue3",
"black")) +
           theme(legend.position = "right") +
           theme(legend.title = element_blank()) +
           theme(legend.key.size = unit(1.5, "cm")) +
           theme(legend.text = element_text(size = 11)) +
      ggtitle("Internal Revenue through Time") +
           xlab("Year") +
           ylab("Average NIS/Student") +
      theme(title = element_text(size = 18),
           axis.text = element_text(size = 12),
           axis.title = element_text(size = 14)) +
           theme(plot.title = element_text(hjust = 0.5)) +
      theme(plot.margin = unit(c(1,1,1.5,1.2), "cm")) +
```

```
            theme(axis.title.y = element_text(margin = margin(t=5,r=5,b=5,l=5,unit="pt"))) +
            theme(axis.title.x = element_text(margin = margin(t=5,r=5,b=5,l=5,unit="pt"))) +
        scale_x_continuous(breaks = seq(2008,2018,1))


      # Total Revenue
      ggplot(budget, aes(x = year, y = average, color = community)) +
        geom_line(data = totalri, size = 2) +
        geom_line(data = totalrj, size = 2) +
        geom_line(data = totalra, size = 2) +
        geom_line(data = totalrm, size = 2) +
        geom_line(data = totalrc, size = 2) +
        geom_line(data = totalrd, size = 2) +
        theme_bw() +
        scale_color_manual(values=c("chartreuse4", "orange", "red", "deepskyblue", "blue3",
"black")) +
            theme(legend.position = "right") +
            theme(legend.title = element_blank()) +
            theme(legend.key.size = unit(1.5, "cm")) +
            theme(legend.text = element_text(size = 11)) +
        ggtitle("Total Revenue through Time") +
            xlab("Year") +
            ylab("Average NIS/Student") +
        theme(title = element_text(size = 18),
            axis.text = element_text(size = 12),
            axis.title = element_text(size = 14)) +
            theme(plot.title = element_text(hjust = 0.5)) +
        theme(plot.margin = unit(c(1,1,1.5,1.2), "cm")) +
            theme(axis.title.y = element_text(margin = margin(t=5,r=5,b=5,l=5,unit="pt"))) +
            theme(axis.title.x = element_text(margin = margin(t=5,r=5,b=5,l=5,unit="pt"))) +
        scale_x_continuous(breaks = seq(2008,2018,1))

      # Expenses for Employment
      ggplot(budget, aes(x = year, y = average, color = community)) +
        geom_line(data = exedi, size = 2) +
        geom_line(data = exedj, size = 2) +
        geom_line(data = exeda, size = 2) +
        geom_line(data = exedm, size = 2) +
        geom_line(data = exedc, size = 2) +
        geom_line(data = exedd, size = 2) +
        theme_bw() +
        scale_color_manual(values=c("chartreuse4", "orange", "red", "deepskyblue", "blue3",
"black")) +
            theme(legend.position = "right") +
            theme(legend.title = element_blank()) +
            theme(legend.key.size = unit(1.5, "cm")) +
            theme(legend.text = element_text(size = 11)) +
        ggtitle("Expenses for Employment through Time") +
            xlab("Year") +
            ylab("Average NIS/Student") +
        theme(title = element_text(size = 18),
            axis.text = element_text(size = 12),
            axis.title = element_text(size = 14)) +
            theme(plot.title = element_text(hjust = 0.5)) +
        theme(plot.margin = unit(c(1,1,1.5,1.2), "cm")) +
            theme(axis.title.y = element_text(margin = margin(t=5,r=5,b=5,l=5,unit="pt"))) +
            theme(axis.title.x = element_text(margin = margin(t=5,r=5,b=5,l=5,unit="pt"))) +
        scale_x_continuous(breaks = seq(2008,2018,1))

      # Total Expenses
      ggplot(budget, aes(x = year, y = average, color = community)) +
        geom_line(data = totalexi, size = 2) +
        geom_line(data = totalexj, size = 2) +
        geom_line(data = totalexa, size = 2) +
        geom_line(data = totalexm, size = 2) +
        geom_line(data = totalexc, size = 2) +
        geom_line(data = totalexd, size = 2) +
        theme_bw() +
        scale_color_manual(values=c("chartreuse4", "orange", "red", "deepskyblue", "blue3",
"black")) +
            theme(legend.position = "right") +
```

```
            theme(legend.title = element_blank()) +
            theme(legend.key.size = unit(1.5, "cm")) +
            theme(legend.text = element_text(size = 11)) +
      ggtitle("Total Expenses through Time") +
            xlab("Year") +
            ylab("Average NIS/Student") +
      theme(title = element_text(size = 18),
            axis.text = element_text(size = 12),
            axis.title = element_text(size = 14)) +
            theme(plot.title = element_text(hjust = 0.5)) +
      theme(plot.margin = unit(c(1,1,1.5,1.2), "cm")) +
            theme(axis.title.y = element_text(margin = margin(t=5,r=5,b=5,l=5,unit="pt"))) +
            theme(axis.title.x = element_text(margin = margin(t=5,r=5,b=5,l=5,unit="pt"))) +
      scale_x_continuous(breaks = seq(2008,2018,1))

    # Bagrut
    ggplot(budget, aes(x = year, y = average, color = community)) +
      geom_line(data = bagruti, size = 2) +
      geom_line(data = bagrutj, size = 2) +
      geom_line(data = bagruta, size = 2) +
      geom_line(data = bagrutm, size = 2) +
      geom_line(data = bagrutc, size = 2) +
      geom_line(data = bagrutd, size = 2) +
      theme_bw() +
      scale_color_manual(values=c("chartreuse4", "orange", "red", "deepskyblue", "blue3",
"black")) +
      theme(legend.position = "right") +
      theme(legend.title = element_blank()) +
      theme(legend.key.size = unit(1.5, "cm")) +
      theme(legend.text = element_text(size = 11)) +
      ggtitle("Bagrut Data through Time") +
      xlab("Year") +
      ylab("Percent of Students Eligible for Bagrut") +
      theme(title = element_text(size = 18),
            axis.text = element_text(size = 12),
            axis.title = element_text(size = 14)) +
      theme(plot.title = element_text(hjust = 0.5)) +
      theme(plot.margin = unit(c(1,1,1.5,1.2), "cm")) +
      theme(axis.title.y = element_text(margin = margin(t=5,r=5,b=5,l=5,unit="pt"))) +
      theme(axis.title.x = element_text(margin = margin(t=5,r=5,b=5,l=5,unit="pt"))) +
      scale_x_continuous(breaks = seq(2008,2018,1))

    # University Bagrut
    ggplot(budget, aes(x = year, y = average, color = community)) +
      geom_line(data = ubagruti, size = 2) +
      geom_line(data = ubagrutj, size = 2) +
      geom_line(data = ubagruta, size = 2) +
      geom_line(data = ubagrutm, size = 2) +
      geom_line(data = ubagrutc, size = 2) +
      geom_line(data = ubagrutd, size = 2) +
      theme_bw() +
      scale_color_manual(values=c("chartreuse4", "orange", "red", "deepskyblue", "blue3",
"black")) +
      theme(legend.position = "right") +
      theme(legend.title = element_blank()) +
      theme(legend.key.size = unit(1.5, "cm")) +
      theme(legend.text = element_text(size = 11)) +
      ggtitle("University Bagrut Data through Time") +
      xlab("Year") +
      ylab("Percent of Students Eligible for University Bagrut") +
      theme(title = element_text(size = 18),
            axis.text = element_text(size = 12),
            axis.title = element_text(size = 14)) +
      theme(plot.title = element_text(hjust = 0.5)) +
      theme(plot.margin = unit(c(1,1,1.5,1.2), "cm")) +
      theme(axis.title.y = element_text(margin = margin(t=5,r=5,b=5,l=5,unit="pt"))) +
      theme(axis.title.x = element_text(margin = margin(t=5,r=5,b=5,l=5,unit="pt"))) +
      scale_x_continuous(breaks = seq(2008,2018,1))
```

Appendix D

```
## Making Graphs for Thesis

## Preliminaries

rm(list = ls())
getwd()
setwd("/Users/Owner/Documents/Thesis/")
list.files()

library(readxl)
library(tidyverse)
library(dplyr)

# Read the Data

combo <- read_excel("Thesis Spreadsheet - Statistics.xlsx", "Combo")
combo.tbl <- as_tibble(combo)
combo

#Rename the Variables

names(combo.tbl)[names(combo.tbl) == "Internal Revenue/Student"] <- "internal"
names(combo.tbl)[names(combo.tbl) == "Education/Student"] <- "total_revenue"
names(combo.tbl)[names(combo.tbl) == "Employing People in Education/Student"] <- "employment"
names(combo.tbl)[names(combo.tbl) == "Total Education Expense/Student"] <- "total_expense"
names(combo.tbl)[names(combo.tbl) == "Bagrut Certificate"] <- "bagrut"
names(combo.tbl)[names(combo.tbl) == "College-Eligible Bagrut Certificate"] <-
"university_bagrut"


combo.tbl

## Graphing

# Internal Revenue and Bagrut
ggplot(data = combo.tbl, mapping = aes(x = internal, y = bagrut)) +
  geom_point(size = 2, color = "red") +
  theme_bw() +
  ggtitle("Internal Revenue and Bagrut Relationship") +
  xlab("Internal Revenue per Student") +
  ylab("Percent of Students Eligible for the Bagrut") +
  theme(title = element_text(size = 18),
        axis.text = element_text(size = 12),
        axis.title = element_text(size = 14)) +
  theme(plot.title = element_text(hjust = 0.5)) +
  theme(plot.margin = unit(c(1,1,1.5,1.2), "cm")) +
  theme(axis.title.y = element_text(margin = margin(t=5,r=5,b=5,l=5,unit="pt"))) +
  theme(axis.title.x = element_text(margin = margin(t=5,r=5,b=5,l=5,unit="pt"))) +
  xlim(0,10000) +
  geom_smooth(method = "lm")

# Internal Revenue and University Bagrut
ggplot(data = combo.tbl, mapping = aes(x = internal, y = university_bagrut)) +
  geom_point(size = 2, color = "red") +
  theme_bw() +
  ggtitle("Internal Revenue and University Bagrut Relationship") +
  xlab("Internal Revenue per Student") +
  ylab("Percent of Students Eligible for the University Bagrut") +
  theme(title = element_text(size = 18),
        axis.text = element_text(size = 12),
        axis.title = element_text(size = 14)) +
  theme(plot.title = element_text(hjust = 0.5)) +
  theme(plot.margin = unit(c(1,1,1.5,1.2), "cm")) +
  theme(axis.title.y = element_text(margin = margin(t=5,r=5,b=5,l=5,unit="pt"))) +
  theme(axis.title.x = element_text(margin = margin(t=5,r=5,b=5,l=5,unit="pt"))) +
  xlim(0,10000) +
  geom_smooth(method = "lm")

# Total Revenue and Bagrut
```

```
ggplot(data = combo.tbl, mapping = aes(x = total_revenue, y = bagrut)) +
  geom_point(size = 2, color = "purple") +
  theme_bw() +
  ggtitle("Total Revenue and Bagrut Relationship") +
  xlab("Total Revenue per Student") +
  ylab("Percent of Students Eligible for the Bagrut") +
  theme(title = element_text(size = 18),
        axis.text = element_text(size = 12),
        axis.title = element_text(size = 14)) +
  theme(plot.title = element_text(hjust = 0.5)) +
  theme(plot.margin = unit(c(1,1,1.5,1.2), "cm")) +
  theme(axis.title.y = element_text(margin = margin(t=5,r=5,b=5,l=5,unit="pt"))) +
  theme(axis.title.x = element_text(margin = margin(t=5,r=5,b=5,l=5,unit="pt"))) +
  geom_smooth(method = "lm")+
  xlim(0,40000)

# Total Revenue and University Bagrut
ggplot(data = combo.tbl, mapping = aes(x = total_revenue, y = university_bagrut)) +
  geom_point(size = 2, color = "purple") +
  theme_bw() +
  ggtitle("Total Revenue and University Bagrut Relationship") +
  xlab("Total Revenue per Student") +
  ylab("Percent of Students Eligible for the University Bagrut") +
  theme(title = element_text(size = 18),
        axis.text = element_text(size = 12),
        axis.title = element_text(size = 14)) +
  theme(plot.title = element_text(hjust = 0.5)) +
  theme(plot.margin = unit(c(1,1,1.5,1.2), "cm")) +
  theme(axis.title.y = element_text(margin = margin(t=5,r=5,b=5,l=5,unit="pt"))) +
  theme(axis.title.x = element_text(margin = margin(t=5,r=5,b=5,l=5,unit="pt"))) +
  geom_smooth(method = "lm")+
  xlim(0,40000)

# Employment Expenses and Bagrut
ggplot(data = combo.tbl, mapping = aes(x = employment, y = bagrut)) +
  geom_point(size = 2, color = "aquamarine3") +
  theme_bw() +
  ggtitle("Employment Expenses and Bagrut Relationship") +
  xlab("Employment Expenses per Student") +
  ylab("Percent of Students Eligible for the Bagrut") +
  theme(title = element_text(size = 18),
        axis.text = element_text(size = 12),
        axis.title = element_text(size = 14)) +
  theme(plot.title = element_text(hjust = 0.5)) +
  theme(plot.margin = unit(c(1,1,1.5,1.2), "cm")) +
  theme(axis.title.y = element_text(margin = margin(t=5,r=5,b=5,l=5,unit="pt"))) +
  theme(axis.title.x = element_text(margin = margin(t=5,r=5,b=5,l=5,unit="pt"))) +
  geom_smooth(method = "lm")+
  xlim(0,25000)

# Employment Expenses and University Bagrut
ggplot(data = combo.tbl, mapping = aes(x = employment, y = university_bagrut)) +
  geom_point(size = 2, color = "aquamarine3") +
  theme_bw() +
  ggtitle("Employment Expenses and University Bagrut Relationship") +
  xlab("Employment Expenses per Student") +
  ylab("Percent of Students Eligible for the University Bagrut") +
  theme(title = element_text(size = 18),
        axis.text = element_text(size = 12),
        axis.title = element_text(size = 14)) +
  theme(plot.title = element_text(hjust = 0.5)) +
  theme(plot.margin = unit(c(1,1,1.5,1.2), "cm")) +
  theme(axis.title.y = element_text(margin = margin(t=5,r=5,b=5,l=5,unit="pt"))) +
  theme(axis.title.x = element_text(margin = margin(t=5,r=5,b=5,l=5,unit="pt"))) +
  geom_smooth(method = "lm")+
  xlim(0,25000)

# Total Expenses and Bagrut
ggplot(data = combo.tbl, mapping = aes(x = total_expense, y = bagrut)) +
  geom_point(size = 2, color = "darkgoldenrod2") +
  theme_bw() +
```

```
  ggtitle("Total Expenses and Bagrut Relationship") +
  xlab("Total Expenses per Student") +
  ylab("Percent of Students Eligible for the Bagrut") +
  theme(title = element_text(size = 18),
        axis.text = element_text(size = 12),
        axis.title = element_text(size = 14)) +
  theme(plot.title = element_text(hjust = 0.5)) +
  theme(plot.margin = unit(c(1,1,1.5,1.2), "cm")) +
  theme(axis.title.y = element_text(margin = margin(t=5,r=5,b=5,l=5,unit="pt"))) +
  theme(axis.title.x = element_text(margin = margin(t=5,r=5,b=5,l=5,unit="pt"))) +
  geom_smooth(method = "lm")+
  xlim(0,40000)

# Total Expenses and University Bagrut
ggplot(data = combo.tbl, mapping = aes(x = total_expense, y = university_bagrut)) +
  geom_point(size = 2, color = "darkgoldenrod2") +
  theme_bw() +
  ggtitle("Total Expenses and University Bagrut Relationship") +
  xlab("Total Expenses per Student") +
  ylab("Percent of Students Eligible for the University Bagrut") +
  theme(title = element_text(size = 18),
        axis.text = element_text(size = 12),
        axis.title = element_text(size = 14)) +
  theme(plot.title = element_text(hjust = 0.5)) +
  theme(plot.margin = unit(c(1,1,1.5,1.2), "cm")) +
  theme(axis.title.y = element_text(margin = margin(t=5,r=5,b=5,l=5,unit="pt"))) +
  theme(axis.title.x = element_text(margin = margin(t=5,r=5,b=5,l=5,unit="pt"))) +
  geom_smooth(method = "lm")+
  xlim(0,40000)
```