An Alternative Model of University Endowment

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1 Introduction

The typical revenue of a university is composed of tuition income from conventional students and from online programs, direct government support and subsidies, research grants from public and private agencies, research contracts from companies, royalty and license income from patents, gifts and donations from private sources and in some cases endowment income. Although tuition, research grants, patents, and donations all bring in revenue, many universities pay considerable attention to generating additional funds from their endowment funds. An endowment is an aggregation of assets and investments to generate money for supporting the university's educational and research mission [1, 2]. Most institutions with endowments never spend the principal of their endowment, while they consider part of the interests and dividends as usable income. The unused part of the endowment earnings is reinvested to protect the value of endowment against inflation [3].

There is no or very little increase in productivity in education when compared to other goods. In the United States, the cost of education increased above inflation rate steadily over time [4]. Hence, the tuition amount became unaffordable for many families in the United States. A good size endowment allows a university to broaden the access of the university to all social classes of society, reduce its tuition rate, provide more financial aid or tuition discount [5], and hence increase the student selectivity in admissions while keeping the quality of education at a high level. While most revenues of a university may fluctuate because of varying economic conditions, the presence of an endowment provides a stabilized and steady stream of income and a financial buffer [6]. This stability enables a university to support faculty positions, student scholarships, risky research projects, intercollegiate sports, music and arts,

innovative technologies, and library purchasing even in dire economic circumstances. Therefore, an endowment permits a university to make strong commitments going into the future, comforted by the fact that the endowment income will always be available and makes the university to be "immortal" [7].

In the United States, where university endowments are very common, about 650 universities have endowments over \$50 million, while about 62 institutions have endowments exceeding \$1 billion. Although the endowment income is a modest fraction of the annual budget of most institutions, many non-profit [8] universities¹ rely on income from their endowments. There is a direct and strong correlation between the success of the university and the size of its endowment. At the wealthiest schools, the tuition income is on the average 10% of the revenues. They use the endowment income to offer financial aid packages or tuition discounts to students, to build a state-of-art laboratory, to hire top faculty members. On the other hand, at universities with smaller endowments, the tuition income is more than 60% of the revenues. There is a good correlation between the size of the endowment and the success and reputation of a university. For example, Harvard University's endowment is the largest in the world, and Harvard is ranked as the top institution of the world by most ranking agencies [9, 10].

2 Conventional University Endowment Model

The concept of endowment originated in England in the sixteenth century. In the United States, where many universities have an endowment, the endowment model goes

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¹A nonprofit university is barred from distributing its net surplus, if any, to individuals who control it, such as trustees. Such surpluses should be devoted in its entirety to financing further research, teaching, or scholarly activities.

back to Keynes [11]. An endowment is a form of saving to be spent in the future. In theory, it will be used to provide lower tuition, more teaching, and more research. The endowments are managed as if the university expects to live on forever. The investment objective of Northwestern University is stated as "... to preserve their purchasing power ... over time must achieve on average, an annual total rate of return equal to inflation plus actual spending".

Yale University's endowment spending rule requires spending an amount equal to 70% of the amount spent in the previous year plus 1.35% of the current market value of the endowment. This rule makes sure that in the long run, the real value of the endowment does not decrease. It also assures that the university receives a steady income from endowment even in market downturns.

In the United States, many Universities shifted their endowment investments from fixed income to equities and later to hedge funds or venture capital to increase their returns [12]. In 2012, about one-third of the university endowment portfolio was in private equity and hedge funds [13]. This shift of nearly 75% of funds in risky assets provided good returns at good times of the market while increasing the market risk considerably [14]. Many endowment managers preferred to increase the endowment size [15] rather than provide a more than normal payout to the university at good times. As a result, the growth rate of the average endowment has outpaced the growth rate of the university expenditures. Harvard University's endowment was \$4.2 billion in 1988, became \$34.7 in 2007 and grew to \$41 billion in 2019, with an average growth rate of 7.7% per year. In the 10 years preceding 2007, the annual return of the largest endowments averaged 11.1%, while for small endowments the same figure was 6.7%.

The universities with larger endowments took larger risks: For example, they can buy entire companies or put money in timber as investments. On the other hand, the universities with smaller endowments can only afford the buy the shares of public companies. Additionally, those universities with larger endowments can afford to hire more talented money managers due to the economics of scale [4].

When the market moved in the negative direction, many endowments failed to provide support to the university in the very period it is needed the most [12], since more than half of aggregate university endowments are allocated to illiquid assets [16]. During the large market downturns of 2001–2002, 2008–2009 and the Covid-19 pandemic crisis of 2020, the universities with the huge endowments preferred to cut back on expenditures, instead of using their endowments to help ameliorate the financial effects of the pandemic and avoiding furloughs and layoffs of their economically most vulnerable and low-paid workers and independent contractors. While their endowments grew on the average of 9% yearly in the past 40 years, many such universities hesitated

or not allowed to use the 8% from the principal of their endowments to reduce the effects of the crisis.

3 An Alternative University Endowment Model: Ownership of For-Profit Companies

In many developing countries, the bond market or stock market is not well developed and they are usually shallow. In such countries, the conventional university endowment model of the United States may not be directly applicable. Moreover, the donation and giving culture of the society may not exist. Alternative approaches to generate revenues for universities should be considered.

Some universities are located within cities and they are usually referred to as city universities. Students of such universities benefit the convenience of living in a city with a large diversity of available amenities. Almost all of the needed services for a student's life are available in the city already: They can rent out apartments in the region of their choice for their housing. They can use public transportation for their mobility within the city. They can enjoy the diversity of catering, accommodation, shopping variety, endless social opportunities. They may use public or private sports centers. The nightlife of the city gives the students added adventure and a chance to meet different people.

On the other hand, many campus universities are located outside cities. Such universities are mostly insulated from the outside world. They operate like small cities of their own. Campus universities provide a community spirit and a cozier experience to its students. However, they need to provide the essential services to the students for their proper operation: Catering services in the campus, housing in the form of dormitories or residences, transportation to and from the nearest city center, security within the campus, shopping facilities and many similar services. Many universities outsource most of these services to third party companies. These companies may be asked to pay a fee to the university, because of the privileges they got within the campus. Having jurisdiction over such an ecosystem provides a good opportunity for the university to use it for its future.

3.1 Service Needs of a Campus University as Seeds for Companies

A campus university may want to set up university-owned companies as income generators, supplementing its conventional revenue sources. It may be the preferred approach when the university does not have a significant endowment capital to be invested in money markets.

As many startup companies are founded every year, starting a business is not an easy task [17]. On average nine

out of ten startup companies fail [18]. The most difficult stage of an emerging company is its initial startup phase, when it does not have the customer base and cannot generate revenue. The main failure mechanism is the lack of or insufficient demand for the product the company makes or the service it provides. Therefore, having a desired and original product is the most important attribute of a startup company.

A university campus provides an excellent ecosystem for starting a company. The students on the campus can be possible customers for such a company. Similarly, the needs of the university may justify the formation of a company. Possible areas for companies are listed below:

3.1.1 Bookstore

All universities need a bookstore to sell textbooks, books, school supplies, gifts, collectibles, and apparel to students. A good bookstore is an essential part of a good university. The professors can specify and order the textbooks of the courses they will be giving most conveniently through their university's bookstore. The presence of a bookstore is not only a convenience for students but also improves the belonging feeling of students toward their university. Many university bookstores also sell clothing like t-shirts, sweat-shirts, and outerwear with the logo of the university. They may also offer unique memorabilia related to the university found only in that bookstore. Obviously, this creates a business opportunity for the university.

3.1.2 Foodservice and Catering

Campus universities must have food service centers to serve the needs of students. These are mostly in the form of food courts, cafeterias, catered halls, and cafés. Vending machines also serve the needs of the students outside normal dining hours. The quality and price of food is an important satisfaction criterion for the students: They would like to get good food at an affordable price. To increase student satisfaction and reduce complaints many universities have subsidized food centers. The formation of a company by university running the food service and catering operations is certainly a possibility.

3.1.3 Market

Most universities have markets within their boundaries to serve the needs of the student community. Opening hours of such a market should be chosen according to the needs of students. For example, the students living on campus may need a market that is open at least until midnight. Moreover, the goods present in the market could be more suitable and specialized for time-strapped students: Ready-to-eat meals, items more desirable for the young population such as backpacks, bicycle parts, etc. Opening such a market is certainly a good business opportunity for a campus university.

3.1.4 Property Rental

University may rent space for required operations within the campus, like a bank, a travel agency, hairdresser, pharmacy, dry-cleaner, printing, and car-wash services. Having an on-campus gas station with car maintenance facilities is also a convenience for students and faculty. Many of them lack the time to go outside the campus for such amenities. Having such services within the campus can generate rental income for the university. The university also may rent the sports stadium or large auditoriums for third party activities of large participation.

Since marketing rental spaces and collecting rental income professionally requires specialization and know-how, it is desirable to have university property rental company that markets such facilities and collects rental income on behalf of the university.

3.1.5 Shopping Center

Many campus universities have shopping centers within their boundaries. A shopping center investment may pay itself in a relatively short time since most universities increase the real estate value of the neighboring communities. People that are more affluent and that with more expendable funds tend to live near universities. This increases the potential rental income of a university shopping center. Such a center may have a high return on investment.

Renting the space in such a shopping center should be carried out by the property rental company of the university.

3.1.6 University Research Parks

University research parks are considered an important infrastructural mechanism for the transfer of knowledge created at universities to the local economy [19, 20]. It is widely believed that university research parks help enhance the performance of the universities and foster regional innovation. Although the cost of transmitting information is independent of distance, the cost of transmitting knowledge increases with distance, hence the proximity and location of where the information is created and where it will be used matter [21, 22]. In many countries, the formation of university research parks within the boundaries of university campuses is encouraged and sometimes subsidized to act as a catalyst to improve the collaboration between the university and industry, since universities play a central role as producers of basic research and sources of skilled labor. In some countries, tax incentives are given to companies operating in university research parks.

Buildings housing such research parks can be constructed within the boundaries of university campuses to be rented to startups and high technology firms. Many governments support the universities financially for this purpose. A research park would not only increase the visibility and

influence of the hosting university as an engine of growth and regional booster and but also bring revenue in the form of rental income.

3.1.7 Facility Management, Security and Maintenance

A university needs to clean and maintain its physical facilities. It needs to provide security services in many of its buildings. University administrators are usually very busy dealing with high maintenance academics. Optimizing the cost in such operations, what they consider mundane or routine is not in their focus. Hence, performing such services using university-hired personnel is usually inefficient and costly. It is desirable to set up a company with a manager focused on improving efficiency. Such a company may grow and give such services to third parties, improving efficiency even further. Moreover, this company can also provide cleaning, security, and maintenance services of the other university facilities like the shopping center or the university research park.

3.1.8 Energy Production

Electricity bill of most universities is a significant fraction of the yearly budget, especially if the university has cleanroom facilities, a shopping center, or similar high energy-consuming buildings. Most campus universities require more than 50 MVA of electric power. This is a sufficiently large consumption number to justify the formation of an electricity production plant. Combined heat and power plant uses the waste heat from the plant as a source of the heating system of the university, university research park, and its own companies, making it more efficient and hence more economical. The excess electrical energy generated plant may be sold to the national grid, especially during peak consumption periods when the prices are high. Therefore, forming an energy company for a campus university is certainly a possibility.

3.1.9 Hotel

Universities usually organize conferences attended by hundreds of people. Scholars visiting the university to give lectures or seminars are also common. While a university may have large auditoriums to host conference meetings, it usually lacks the comfortable rooms the conference attendees or visiting professors are expecting. Having a four or five-star hotel near the university is a great convenience for such visitors as well as for parents visiting their children studying at the university. Investing for a university-owned hotel is worth considering.

3.1.10 Software

Information technology plays a crucial role in the proper operation of universities. Since universities have diverse needs, many universities developed their software as the

university operating system. Such a software package needs to keep track of student records, statistics, faculty and course records, student evaluations of faculty, and many other academia related records. The development and maintenance of this package require a team of software specialists. It is very risky to depend on a third party software company for this development. If such a company ceases its operations, the university will be in deep trouble.

It is possible to hire software engineers and specialists as university employees for this purpose of developing and maintaining the software package. However, it may be difficult to keep high caliber people with high ambitions as university employees in the long run. Instead of developing the software package with university employees, a university may prefer to set up a software company completely under its control. That software company may market its services to other parties, increasing its revenues even further.

3.1.11 High Technology Startup Companies

When an idea or technology developed at a university is transformed into a good or service it creates a new value for customers. That new idea or technology should be replicable and satisfy the customer needs adequately, in which case it is called innovation. Those proprietary and disruptive ideas form the revolutionary nature of the company. Usually, it is not enough to have a product better than the competitors' product. If the product is only a minor improvement over that of the market leader, the customers tend to stay loyal to the original company [23]. It is therefore imperative to own the first product in the market, rather than to produce the imitations of previously developed ideas with minor improvements. It is observed that research universities tend to produce more startups in contrast to those with teaching focus because completely new ideas originate there. Moreover, universities in large cities are more productive in terms of startup generation in contrast to those in smaller cities [24].

The students with those innovative ideas may not know how to start a company. Many countries have strict and complicated accounting rules, difficult to follow for a novice. A university may provide the initial financing of a startup company easily similar to a rich family providing startup money for a young family member. Moreover, the university may provide guidance, advising, and accounting services to startup companies. This gives such a university-backed startup company an important cost advantage compared to a startup using the bank loans and third party accounting or advising services. In exchange for these services and possibly for the initial capital, the university may have an option to own a share of the company, if the company becomes successful.

Another important factor for a startup company is the presence of talented individuals [25]. Older people are less

likely to be entrepreneurs since they are more risk-averse than the young are; they are less willing to enter risky occupations [26]. University is a diverse environment where talented and young individuals thrive. In a university environment, a startup company has a higher chance of recruiting brilliant, energetic, hardworking, and motivated young graduates. Since many students love their university environment and they do not want to leave the campus, they will be willing to work in a company without leaving their beloved university. This puts the startup companies owned by the university at a definite advantage since they can recruit the best graduates of a university getting references from the past instructors of the students.

3.2 Opportunities Provided by Covid-19 Crisis

Following the Covid-19 crisis of 2020, the countries are more inclined to produce conventional goods locally, since there were problems in importing goods and shortages of some goods were observed. This may give an incentive for countries to raise import duties on goods normally imported. It may be a good time to start companies producing such goods.

Startup companies focused on fabricating kits to detect the presence of the Covid-19 virus or its corresponding antibodies are in many countries supported by the state. This is a great opportunity to start companies working in that direction.

4 Long Term Management of Companies: Establishment of a Holding

A holding is a parent company that owns all the companies in the form of subsidiaries. A holding company does not conduct any operation of its own, does not engage in buying or selling of products or services to third parties. It controls the policies of subsidiary companies and oversees the decisions, but it does not run day-to-day operations. It may run common operations of companies like human resources, internal auditing, and finance department for increased efficiency. In return, it may charge the subsidiaries for these services. Holding companies have a tax advantage in many countries by filing a consolidated tax return by combining the financial records of all the firms including that of itself. If a subsidiary company loses money, it will be offset by the profits of the other companies reducing the tax liability. Its liability is limited by the stock it owns in the subsidiaries: If a subsidiary company goes bankrupt, its creditors can not ask for compensation from the holding company.

If a university owns a significant number of companies, it is reasonable to form a university holding company to reap the benefits of the holding structure.

4.1 Challenges and Risks

The monopolistic nature of the university campus companies should not be exploited by increased prices or low service quality to increase profits. Otherwise, the dissatisfaction of students may result, lowering the attraction of the university in the eyes of potential students. The university companies should see the campus market as a breeding ground and learning environment in their initial years. They should try to expand their operation beyond the home market using the experiences obtained there. The university administration should not hesitate to cease the operation of its own companies if they are not providing quality service at reasonable prices.

In private businesses with private stakeholders, there is a strong motivation to watch and scrutinize the performance of CEOs and professional managers to maximize the profit of the owners. In contrast, a company owned by a university does not have private and direct owners. The mission of a university company is to generate funds for a good purpose: Better research and teaching. Most employees of the company pride themselves on working for such a purpose. On the other hand, in such companies, internal control deficiencies may exist and it is vulnerable to fraud [27]. As it is commonly found in such companies, the monitoring mechanism is usually weak and the executives may get abnormally high and excessive compensation and bonuses rather than reasonable salaries [28]. The executives may put their personal interests above the interest of the company and corruption may occur [29]. Consequently, very strong provisions, frequent reporting requirements, and rigorous corporate governance practices resulting in accountability and transparency must exist to detect and punish managerial incompetency, misbehavior, or fraud [30]. A university-owned company must be audited regularly and rigorously by a well-defined internal and external control mechanism, reporting directly to the holding administration. The external audit partner should be changed at regular intervals to avoid the loss of objectivity over time [31]. The control mechanisms should reasonably assure that the CEO and managers of the company have an effective and efficient operation, they report the financials of the company reliably and the company complies with the laws and regulations of the country. The internal and external audit reports generated by such a control mechanism should provide information to the holding administration on the level of performance of

company managers. The presence of both an internal and an external control mechanisms and the corresponding salaries of internal auditors and fees of external audit companies may seem like an unnecessary cost and burden, but it is a well worth investment in the long run for the well-being of the companies. If the managers are not found to be successful as a result of audit reports, the holding managers should not hesitate to fire incompetent or corrupt managers.

Owning a holding should not change or shift the main mission of the university towards commercial goals [32] and the university should not be influenced by the surrounding corporate culture of the companies. While a university-business partnership is valuable [33], there is a definite threat, if the moneymaking task of the companies interferes with the research and teaching mission of the university. If a university concentrates on making a profit from teaching and research, its mission may be compromised. For this purpose, the companies and the university must be sufficiently separated from each other, and a clash between industrial and academic values should be avoided.

5 Case Study: Bilkent University

5.1 Brief History of Bilkent: A Non-profit Private University

Bilkent University was founded in 1984 by İhsan Doğramacı (1915–2010) as a non-profit private university in Ankara, Turkey's capital city. He aimed to create a center of excellence in higher education and research. The name of the university exemplifies the founder's aim since Bilkent is an acronym of "bilim kenti" in Turkish for "city of science".

Doğramacı, an academic himself, was at Harvard and Washington Universities in the United States between 1944 and 1946, where he had observed the advantages of non-profit research universities. He contributed to the establishment of several state universities and served as rector of Ankara University (1963–1965), as chairman of the Board of Trustees of Middle East Technical University (1965–1967) and as founder and first rector of Hacettepe University (1967–1975). Observing the limitations of the public university system, it had long been his objective to establish a non-profit private university distinguished by its high-quality research and teaching. With this goal in his mind and using his family fortune, he purchased a large tract of land (about 3 km²) near a village in the western hills of Ankara starting in 1967. He first established a construction company (1968) to develop projects on the land he owned. To generate funds for the university, he founded a furniture factory (1969), the first mass-production facility in Turkey with modern imported fabrication equipment at a time when Turkey was in a currency exchange rate crisis and was not

able to import. He then founded an information technology company (1976) selling and developing software for mini-computers, the first of its kind with Turkish capital.

He advocated for decades for the Turkish legal system to allow non-profit private higher education institutions. His dream finally materialized in 1982 when a constitutional clause that he proposed was accepted. This clause allowed the formation of private universities, called "Vakıf² (foundation) university", as long as the institution operates under non-profit rules. According to the Turkish constitution, the founders of the university have full control of the university, but they are not allowed to get any dividends from the surplus that the university might generate.

After the constitutional amendment, he established Bilkent University in 1984. Some of the lands is developed in the form of apartment complexes to generate funds for the further development of the university. The presence of the university increased the real estate value of the land, and the region known as Bilkent became one of the most attractive locations in Ankara. The construction of a shopping center (1996) within the boundaries of the university increased the attraction of the region even more since the shopping center with a very large supermarket operated by a German company and with a large parking lot was the first of its kind in Turkey. On the weekends, the road to Bilkent was congested with cars trying to visit the shopping center. The establishment of a sports club, again first of its kind in Turkey, added to the value of the neighborhood.

Construction of housing for academic staff, cafeterias, student dormitories, the Student Union building, and various academic buildings followed in rapid succession. Buildings and facilities include a semi-Olympic indoor swimming pool, a concert hall for Bilkent Symphony Orchestra, and a semi-covered outdoor auditorium that hosts 4000 people.

Bilkent University admitted its first 386 undergraduate and graduate students in 1986. As of 2020, there are over 12,000 students. Among them are international students and exchange students from 73 countries. Around 64% of the student body benefits from a variety of scholarships. The tuition income of the university is only 43% of its operating budget.

²"Vakıf" is an Ottoman non-profit institution that is established mostly by wealthy philanthropists by donating funds or assets as starting capital for pursuing a public mission. Vakıf is supposed to generate funds on its own to be sustainable for continued operation as a public service, just like a university endowment. For example, founded by a Vakıf, a "külliye" was an Ottoman establishment containing a school ("medrese") providing education service without tuition, a hotel ("han") and Turkish bath ("hamam") generating profits to support the operation of the school.

5.2 For-Profit-Companies Owned by Bilkent University

Bilkent University owns 29 companies with a total of 29,000 employees as of June 2020. Most of the companies are the oldest or first companies in their fields. In terms of market share in Turkey, they rank in the top three in most cases. The companies are owned 100% by the university and they operate in areas like construction,³ prefabricated building,⁴ construction materials,⁵ security⁶ and building maintenance services,⁷ real estate management,⁸ shopping centers,⁹ insurance, furniture,¹⁰ hospitality,¹¹ catering,¹² university science park,¹³ printing,¹⁴ and defense electronics.¹⁵ The university is also a shareholder in the largest airport operator,¹⁶ airport construction¹⁷ and ferry operator¹⁸ companies of Turkey. The first sports club¹⁹ in Turkey belong to Bilkent University. Research on semiconductors by Bilkent faculty lead to the formation of the first semiconductor fabrication company²⁰ of the country.

5.3 Management of Companies: Bilkent Holding²¹

The board of the holding is composed of five members: the Rector and three professors from the university and the CEO of the holding. The rector acts as the chairman of the board. The companies are grouped under four directors. Each subsidiary company has five-member boards chaired by the relevant director. Professionals manage the day-to-day operations of the companies. They need to use the arms-length principle for dealings with university. The companies are not obliged to hire the graduates of the university, although many graduates of the university work at

university companies. Their sole purpose is to generate funds for the university. The managers of the companies are rewarded in relation to the profit of the company. The university provides reduced tuition for the children of the company employees if they are accepted to the university through the national university entrance exam system.

6 Conclusions

To diversify the conventional revenues of a university, universities with high aspirations should try to set up an endowment fund. The presence of such a fund will support the university in difficult times when other revenue sources are in trouble and the conventional income of the university is reduced.

Philanthropy is not encouraged by the tax system in all countries. Raising funds for university through voluntary contributions of alumni or wealthy individuals may be difficult due to the absence of the donation culture of the country. While raising cash for the university endowment may be difficult, setting up companies may be easier, especially in a developing country. Covid-19 crisis also provides an opportunity to start companies in areas normally dominated by imported goods. Starting a group of companies owned by a university to generate funds for the university is certainly a good possibility especially for a campus university. Using the service needs of the students can provide a breeding ground for such companies. The companies should avoid exploiting their dominance in the campus market to maximize their profits. Instead, they should try to extend their operations beyond the campus limits, to increase their revenues and profits by using the know-how gained at the home.

Ideas originating from the university may also lead to startup companies with the university being a shareholder. Not all such startups will be successful, but if they do, they will bring significant revenue for the endowment of the university.

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