New Economy Initiative: Fiscal Breakeven for the Arizona State University Budget Request

Prepared for:
The Arizona Board of Regents
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Rounds Consulting Group, Inc. (RCG) was tasked with independently analyzing the economic and fiscal impact of **Arizona State University's (ASU)** $46M workforce development investment proposal. The purpose of this analysis is to identify whether or not the state's taxpayer investment will yield a positive return on investment (ROI) within a certain number of years. *Note: The analysis of the other university budget requests will be delivered in separate documents.*

For FY 2021, ASU developed a proposal focused on increasing the supply of "New Economy" engineers by bolstering graduation rates in high-demand and high-wage engineering disciplines. To do so, ASU requested state funding of $46M to launch the largest center for engineering education and research in the nation. Funding will be used for research and development, increasing faculty and staff, and producing more engineering graduates in key areas of the New Economy. The wages for these individuals will be relatively high and will escalate over time. This will produce economic and fiscal impacts at an increasing rate over time.

In order to quantify the economic impact produced by the $46M annual investment and the increased production of engineering graduates in the New Economy, a customized economic model was developed. The model measures the direct and resulting multiplier effects produced by the proposed funding in terms of economic output, jobs, labor income, and government tax revenues. The analysis is unique in that it considers synergy created when university and private sector endeavors converge, which further increases wage levels and business development. Additional analyses were produced related to innovation potential. Finally, interviews with economic development experts were conducted to confirm or refute the assumptions contained in the analysis.

The timeframe for comparison is unique to different proposals. The state has utilized a 5-year breakeven analysis on business recruitment projects, while cities and towns typically defer to 10 years for individual business location analyses. When infrastructure issues are considered, such as transportation, communications, or longer-term workforce efforts, the breakeven goal falls within 20-40 years. "Hard" infrastructure investments, such as roads, are typically analyzed between 20-40 years, while "soft" infrastructure investments, such as education, should not exceed 20 years. In this analysis, the breakeven should occur within 20 years. If the timeframe falls well under this 20-year threshold the project is considered to be a good taxpayer investment.

Key Findings

The budget request is estimated to achieve a breakeven for the state by year 10. In each year thereafter, the positive ROI further advances. The breakeven is approximately half of the desired goal of a positive ROI occurring within 20 years. The benefits are sizeable because the budget request/investment proposal is specific to a key area and builds on the local economy's strengths.

Breakeven Analysis – Cumulative Impacts

ASU estimates that the $46M investment will increase the number of engineering graduates in Arizona by approximately 1,000 per year. Historically, about half of ASU engineering graduates have remained in the state and earn 90% more than the average Arizona worker.

This does not mean ASU is inefficiently training the workforce of other states because Arizona is a net importer of skilled workers due to its strong growth fundamentals. Employment movement across the nation is fluid and these statistics are common.

The additional benefit occurs when specialized engineering programs are matched with private sector activities and the local economy's strengths. Public/private partnerships are also recommended. This results in a higher retention rate as well as higher wages and levels of productivity. The ASU proposal focuses on these efficiencies. Engineering graduate retention is estimated by RCG to advance to 65% or more when the program is fully implemented and integrated with the state's overall economy and economic development entities. However, this analysis uses a more conservative 60% maximum retention rate.

The following table provides a summary of the total (sum of direct, indirect, and induced) jobs, wages, economic output, and tax revenues. Over the 20-year period, an estimated $2.2B in state and local tax revenues will be generated from the $920M investment ($46M a year).

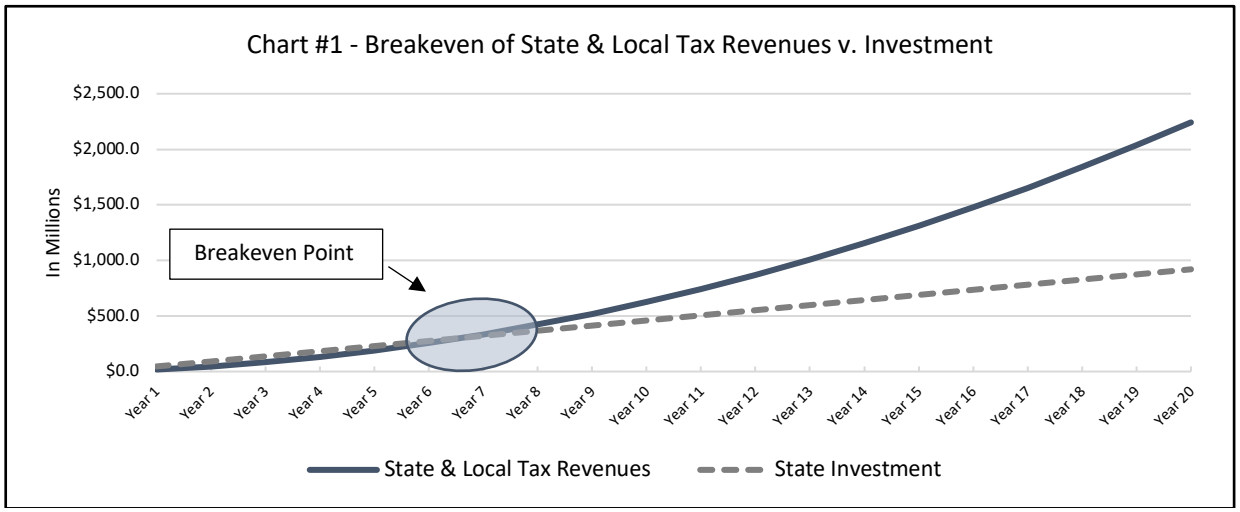
Annual Figures: Economic & Fiscal Impacts – ASU Engineering Proposal

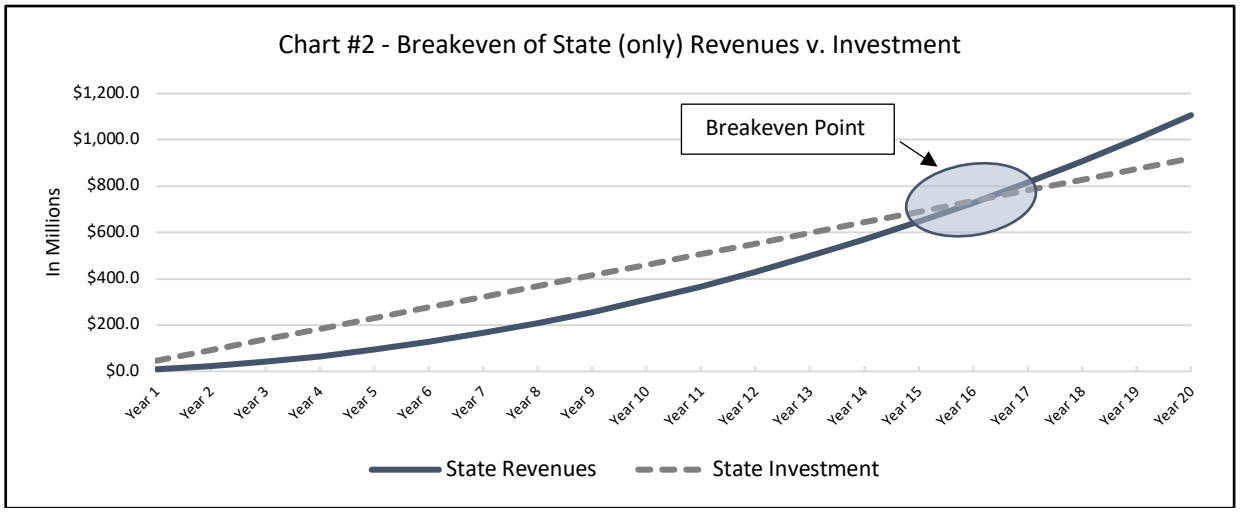
	Total Jobs	Total Wages ($ Millions)	Total Output ($ Millions)	Total Taxes ($ Millions)
Year 5	8,308	$521.3	$1,212.8	$57.7
Year 10	15,652	$987.7	$2,269.5	$107.2
Year 15	22,995	$1,454.0	$3,326.3	$156.6
Year 20	30,338	$1,920.4	$4,383.1	$206.1
Total – 20 Years			$47,504.4	$2,242.2

Breakeven Analysis – Individual Calculation Detail

There are multiple considerations in this analysis. The initial cumulative breakeven point, as shown in Chart #1, is reached in year 7 if both state and local tax revenues are considered. This also displays why local government entities should take a greater interest in higher education proposals, specifically in those that yield a positive return to the taxpayer.

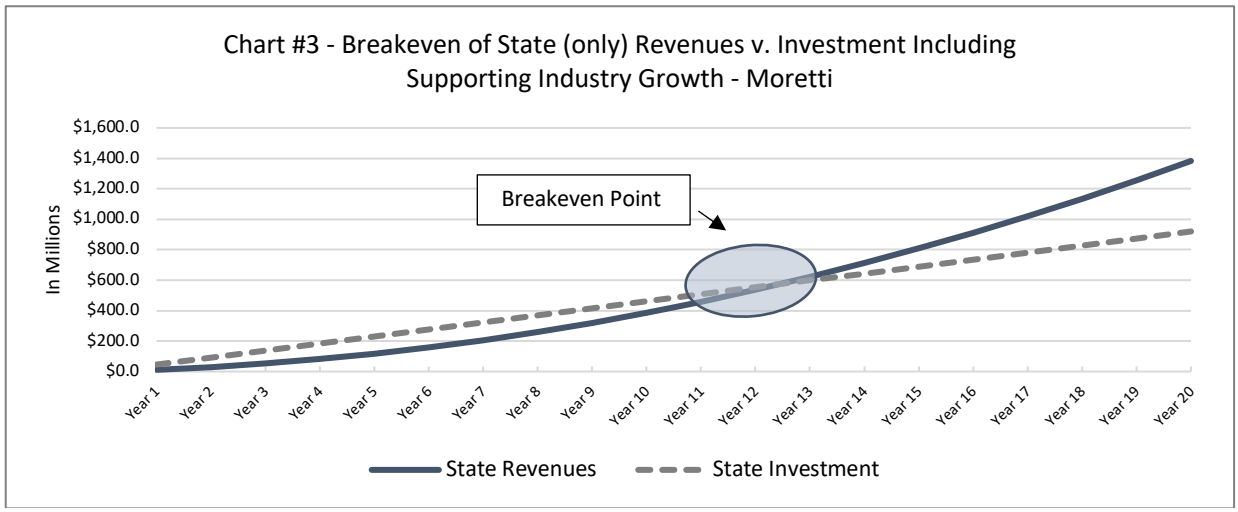
However, a true state ROI calculation requires the comparison of state investments with state tax revenues. When just state tax revenues are considered, and with no consideration of the full list of static and dynamic impacts, breakeven occurs in year 16 (Chart #2). *This excludes approximately 35% of the full economic benefit (related to stronger economic activity lifting other industry sectors as well as business recruitment and retention).*

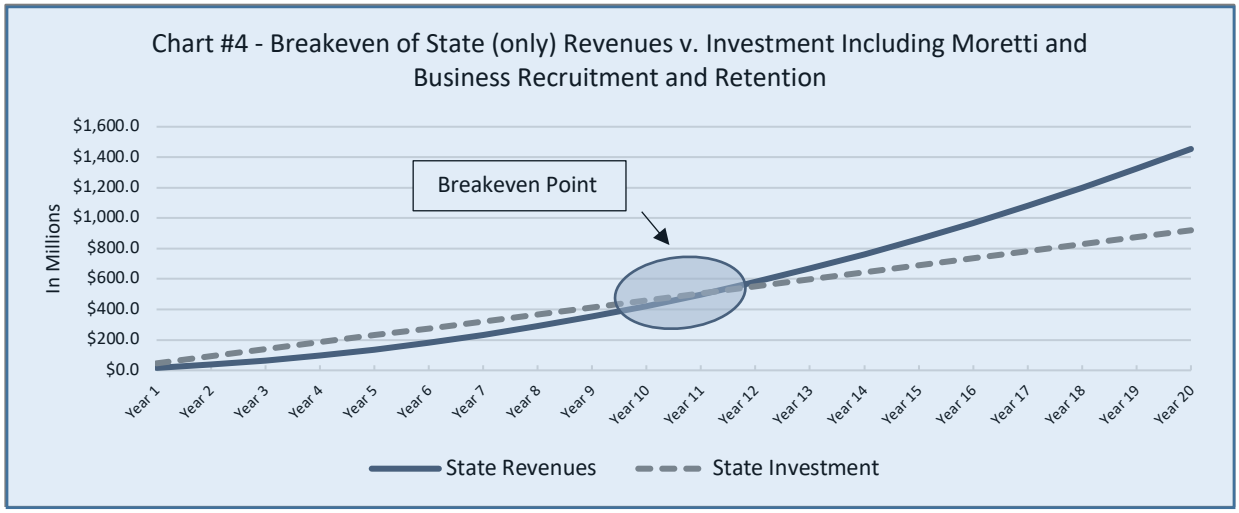




The additional impacts related to further innovation implementation, known as Moretti effects (Chart #3), and growth in economic development recruitment and retention (Chart #4) are also displayed.

Chart #4 represents the most complete economic analysis of ROI including direct, indirect and induced impacts, and the dynamic benefits that are realized under these conditions. The breakeven occurs during the latter part of year 10. Again, this is approximately half of the desired goal of 20 years.





Sensitivity Analyses – Identifying Estimation Error Risk

The analysis included various exercises that strengthen and weaken the key economic inputs to identify a level of confidence within the modeling. For example, both lower and higher graduate figures were analyzed, along with varying levels of graduate retention (example provided below), wages, and impact on the overall economy. Under no conservative set of scenarios did the investment breakeven exceed 20 years.

Additional Considerations

There will exist opportunities for additional economic benefit. For example, a more aggressive stance on high ROI workforce development will lead to more of the occasional large-scale business locations that are promoted every two or three years. For perspective, each 1,000 worker business location or expansion opportunity that averages $100,000 per year in wages will yield another $11.2M in state and local tax collections on an annual basis. New business activity will also require the construction of new facilities and considerable tax revenues will be collected. If the state adds only one new large-scale business every five years, the aforementioned breakeven points would all advance by two years.

On the other hand, there will be an initial delay in the fiscal benefits being fully realized, thus year 5 in this review would normally represent year 7 in terms of years from program implementation. However, as just noted, the large business attraction example of 1,000 new high wage workers being added every five years advances the breakeven point by two years. Therefore, these are offsetting impacts and the estimated breakeven points are an accurate representation of the cost/benefit analysis.

Also, a 60% state retention rate of specialized engineering graduates was used in this analysis. If the retention rate increases by as little as 5%, the breakeven date would advance by one additional year. Similarly, if the retention rate was reduced to 55%, the breakeven point would be pushed back by a year.

Note: These values are only applicable if private sector demand for the engineering jobs increases in proportion. The university will need to continue to develop its ties with the private sector and various government entities for the full potential to be realized. The university needs to be very aggressive in its student recruitment efforts and in keeping the program up-to-date with a changing global marketplace. Policymakers should consider these points as they review the budget request. The university should be asked to provide a clear description of how it plans on maximizing the ROI for the taxpayer.

Conclusion and Recommendation

This independent analysis identifies that ASU's budget request of $46M for an advanced engineering program will yield a benefit to the state's taxpayers in a relatively short period of time, and the extra funds that will arise as a result of the program enhancement can be used for other economy-boosting projects over the next two decades. The benefits will accumulate rapidly if the university continues to assess how the engineering program will blend with changing New Economy demands.

From an economic impact point of view, it is recommended that the university's budget request be seriously considered, but only with sufficient explanation of how the efforts will blend with the state's recent economic momentum, and in full consideration of providing taxpayers with a positive return on their investment.