Cost-Benefit Analysis
African Economic Development Solutions

Prepared by Wilder Research

Authors: Justin Hollis and Stephanie Nelson-Dusek

451 Lexington Parkway North | Saint Paul, Minnesota 55104
651-280-2700 | www.wilderresearch.org

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Executive summary

> *At African Economic Development Solutions, we strive to develop businesses within African immigrant communities. We serve the Twin Cities metropolitan area to create wealth, help immigrants get out of poverty, as well as be part of and benefit from the booming economy (AEDS, 2023).*

African Economic Development Solutions (AEDS) works throughout the Twin Cities metropolitan area to create wealth, lift immigrant communities out of poverty, and contribute to and benefit from the region's vibrant economy. Over the past several decades, the proportion of African-born residents living in the Twin Cities has increased by 72% (Ruggles et al., 2007-2011; 2017-2021). The majority of African-born adults are working (78%) and more than half (56%) have attended at least some college. As Minnesota welcomes more immigrant communities, organizations like AEDS can play an important role in supporting and building the economic success of those who arrive.

Business ownership is an important part of the United States economy and has multiple advantages for business owners in the form of independence, flexible lifestyle, learning opportunities, creative freedom and personal satisfaction, and financial rewards (*Exploring Business*, 2016). In addition, the ability to earn income, own a house, and build and sustain wealth is critical to the health and well-being of all Twin Cities residents, as well as the overall economy.

To learn more about the benefit that AEDS provides to the region, AEDS asked Wilder Research to conduct a cost-benefit analysis of its programming. A cost-benefit analysis estimates the economic impact of programs by comparing costs for providing the program with the value added attributable to program expenditures.

To inform his analysis, Wilder conducted workshops with AEDS staff, reviewed program documentation, and also created a program logic model, rubric for reviewing data, and framework for conducting analysis. Findings from all phases of the work are highlighted throughout this report, and detailed methods are described in the Appendix.

Ultimately, the analysis found that:

- AEDS generates $2.34 for every dollar it invests.
- AEDS has driven over $17 million of value added to the Twin Cities economy since 2009.

This means that, in addition to the unique, culturally specific services that AEDS provides to African immigrants, the organization itself is adding a great deal of value to the Twin Cities economy.

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Introduction

The mission of the African Economic Development Solutions (AEDS) is to confront economic disparities and empower marginalized communities of black heritage. AEDS is an assets-based organization founded around cultural intelligence, with the understanding that language and culture can often be challenges in starting a business in Minnesota. To achieve its mission, AEDS provides the following services throughout the Twin Cities:

- **Business lending:** Small business, micro, credit building, and Sharia compliant loans
- **Business development:** Business development training, technical assistance, and consulting
- **Homeownership education:** Homeownership workshops and one-on-one counseling
- **Community building and creative placemaking:** National African Leadership Conference, forums and networking, and Little Africa festival and parade

To help understand the economic value of its programming and services, AEDS asked Wilder Research to conduct an independent cost-benefit analysis.

What is a cost-benefit analysis?

A cost-benefit analysis is an evaluation method that compares the estimated benefits of a program with its associated costs.

Researchers use program information and relevant, supplemental data to describe the *projected* economic value of the program in dollars. This method assumes that conditions at the time of the study are fully represented by available data and that those conditions remain largely unchanged over the course of future programming.

Methods

Wilder began this project by conducting three 1-hour workshops with AEDS staff to learn more about their work and to understand three important components of a cost-benefit analysis:

1) **Assumptions:** Factors that (presumably) would help AEDS operate to its fullest potential.

2) **Opportunity costs:** The best alternative services for the population that AEDS serves.

3) **Counterfactuals:** The hypothetical state of the economy *without* the presence of AEDS.

Wilder then reviewed AEDS-provided documents to examine the *costs* of operations and determine options for monetizing program *benefits.* After reviewing all documents, Wilder decided to use a *macro*economic approach. A more fine-tuned *micro*economic approach (which allows researchers to measure total costs, enumerate the value of outcomes, and compare benefits and costs) would require AEDS to provide potentially invasive detailed financial data directly from clients including standardized economic activity data like sales, gross receipts, and value of shipments, and a defined time horizon for when benefits cease to occur.

The following report includes two sections: one highlighting the analysis pre-work—themes from the workshops with AEDS staff, a program logic model, and rubric for assessing the quality and completeness of data—and the other detailing final results. The Appendix provides detailed information on methods and the analytical framework.

About AEDS

> *[AEDS] has contributed in expanding the ecosystem by providing culturally specific business development; this did not exist before us. When we launched the Little Africa cultural business district, here in Saint Paul, that concept didn't exist in our communities. There still is no other organization that uses culture as a catalyst for economic development. We are pioneering and leading in this space. – AEDS staff*

Over the past several decades there has been a sharp increase (72%) in the number of African-born people calling the Twin Cities home (Ruggles et al., 2007-2011; 2017-2021). It is more important than ever that there are regional organizations that can support the growing immigrant population and provide culturally competent programs and services. It is particularly important to support immigrants with their language needs; according to Census data, more than one in ten (13%) African-born residents do not speak English, or do not speak it well (Ruggles et al., 2017-2021).

During the initial project workshops, AEDS staff discussed the uniqueness of their work and the cultural competency they bring to African immigrant communities in the Twin Cities. When talking about cost-benefit "assumptions," staff said that their organization is at its best when they can engage with clients, listen to their stories, and provide the services that they need (and even provide services beyond what clients need or expect). Common themes also included providing clients with acceptance, hospitality, and a sense of community.

> *We are at our best when people feel a sense of belonging. Even if they don't receive a service, they feel pride in their community's success…We are showcasing the hard work and resiliency of African immigrants in Minnesota…we use an assets-based model instead of a deficits-based model. – AEDS staff*

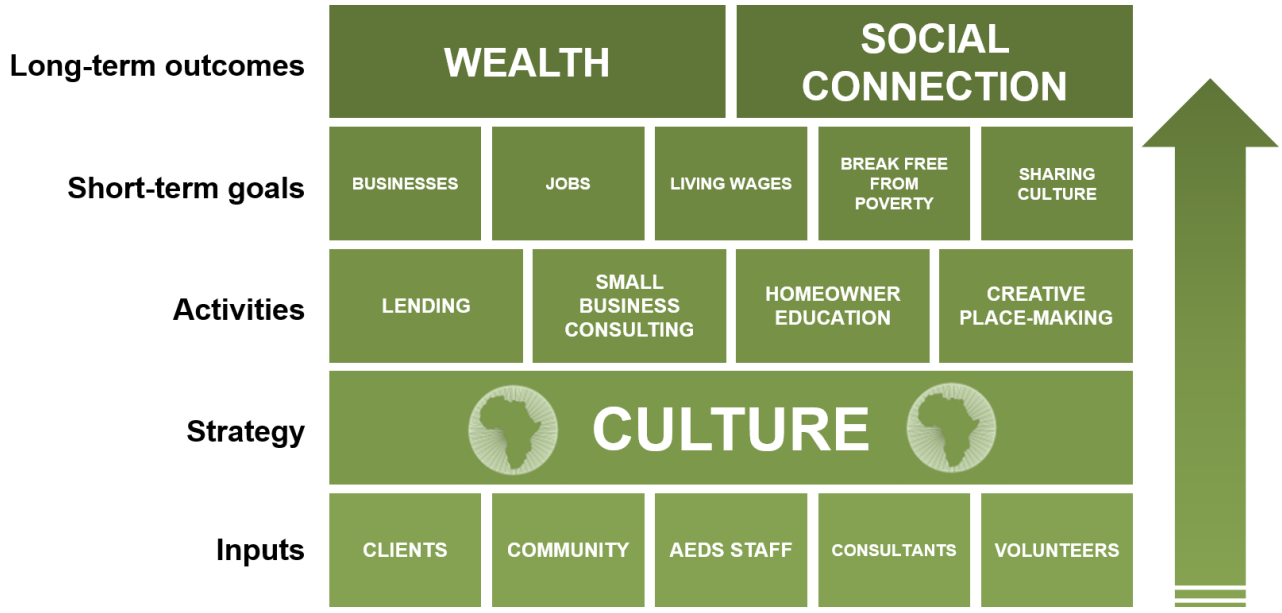
Staff also said that AEDS is at its best when it is fully funded and able to continue providing services, when there is positive feedback from key stakeholders, and when staff themselves feel valued and able to do their best work.

It was more difficult for staff to think of opportunity costs and counterfactuals, because their organization provides a unique set of services for immigrant communities. Staff consistently talked about their cultural competency and ability to meet African immigrants where they are; for example, AEDS staff have first-hand experience coming to Minnesota from African countries and navigating a new culture, technology, language, and norms. Even though it was a difficult exercise, one staff member did talk about the opportunity cost of HUD certification, a compliance requirement for AEDS housing counselors.

> *Lenders in a bank provide loans and wait for the money, but we exist for those who don't have access to traditional financial institutions. – AEDS staff*
>
> *When it comes to housing, we have cultural competency; we look like [clients] and talk like them. But what they lose is that HUD certification. That gives them that $10,000 first time home-buyer certification. We're not HUD certified so a lot of our certificates do not allow them to do that. Other than that, I can't think of anything. – AEDS staff*

In addition to speaking with program staff about AEDS, Wilder reviewed program documents and created a logic model (Figure 1). This logic model is a graphic description of how, through its clients, community, staff, consultants, and volunteers, AEDS uses an integrated strategy to empower marginalized communities of black heritage (in particular African immigrants). Using this strategy, AEDS provides activities that result in short-term changes for client communities and eventually long-term impact on the regional economy.

Figure 1. Logic model



Finally, after reviewing all relevant data, Wilder designed a rubric, outlining all of the potential sources for converting program outcome data into dollars; these include business client finances, client case data, client intake forms, 990 tax filings, and final audit reports (Figure 2). The rubric grades the quality and completeness of these data on availability, usability, reliability, and relevance for informing the analysis.

Figure 2. Rubric

Criteria	Level of data quality/completeness for informing the analysis (5 = highest)				
	1	2	3	4	5
Availability	**Business client finances** such as wage and revenue data from client businesses, loan data from borrowers, housing cost data from homeowners, and willingness to pay data from community members.	**Client case data** outlining program or service provided, demographic, financial did not include pre and post-program financial status for closed cases.	**Client intake forms** establishing pre-program disposition included applicant DBAs did not include details from business plans, dollar amount sought or proposed uses of funding.	**Form 990 Tax filings** from AEDS for the years 2009 – 2021. Balance sheets and income statements substituted for the years 2011, 2012, and 2013.	**Final Audit Report** for the year ending December 2020.
Usability	**Client case data** outlining program or service provided, demographic, financial did not include pre and post-program financial status for closed cases.	**Client intake forms** establishing pre-program disposition included applicant DBAs did not include details from business plans, dollar amount sought or proposed uses of funding.	**Final Audit Report** for the year ending December 2020.	**Business client finances** such as wage and revenue data from client businesses, loan data from borrowers, housing cost data from homeowners, and willingness to pay data from community members.	**Form 990 Tax filings** from AEDS for the years 2009 – 2021. Balance sheets and income statements substituted for the years 2011, 2012, and 2013.
Reliability	**Business client finances** such as wage and revenue data from client businesses, loan data from borrowers, housing cost data from homeowners, and willingness to pay data from community members.	**Client case data** outlining program or service provided, demographic, financial did not include pre and post-program financial status for closed cases.	**Client intake forms** establishing pre-program disposition included applicant DBAs did not include details from business plans, dollar amount sought or proposed uses of funding.	**Final Audit Report** for the year ending December 2020.	**Form 990 Tax filings** from AEDS for the years 2009 – 2021. Balance sheets and income statements substituted for the years 2011, 2012, and 2013.
Relevance	**Final Audit Report** for the year ending December 2020.	**Client intake forms** establishing pre-program disposition included applicant DBAs did not include details from business plans, dollar amount sought or proposed uses of funding.	**Form 990 Tax filings** from AEDS for the years 2009 – 2021. Balance sheets and income statements substituted for the years 2011, 2012, and 2013.	**Client case data** outlining program or service provided, demographic, financial did not include pre and post-program financial status for closed cases.	**Business client finances** such as wage and revenue data from client businesses, loan data from borrowers, housing cost data from homeowners, and willingness to pay data from community members.

Results

The results of a cost-benefit analysis are calculated by dividing the estimated value of program benefits by its estimated costs. To find program *costs*, Wilder reviewed AEDS 990 tax filings, available balance sheets, and income statements. Between 2010 and 2021, those expenses totaled $7,264,475 (Figure 3). Costs consisted of program service expenditures, management and general operating costs, and fundraising expenses.

Program *benefits* included the total of value added components from ripple effects of AEDS expenses for nearly 500 industries, including the nonprofit/adult education sector to which AEDS belongs. The largest value added for employee compensation included the credit intermediation sector ($341,000), management of companies and enterprises sector ($258,000), and the employment services sector ($212,000). Industries where proprietor income had the largest increases included other real estate ($93,000) and the management consulting services sector ($30,000). The most impacted sector in terms of other property income went to owner-occupied dwellings ($684,000).

In total, AEDS has been responsible for over $17 million in value added to the Twin Cities economy since 2009. For every dollar stewarded by AEDS, the organization has generated $2.34 in returns to the local economy. The economic impact on business owners, entrepreneurs, marginalized communities of black heritage, primarily African immigrants, is apparent. AEDS has created wealth, broken bonds of poverty, and continues to successfully build strong ties within and across communities in the region.

Figure 3. Benefit-cost analysis[1]

Costs	
Programs and services	$6,453,405
Management and general	$559,795
Fundraising	$251,275
Total expenses	**$7,264,475**
Benefits	
Employee compensation	$12,362,630
Proprietor income	$1,004,180
Taxes on production and imports (net of subsidies)	$762,355
Other property income	$2,896,206
Total value added	**$17,025,371**
Benefit-to-Cost Ratio	**$2.34**

[1] IMPLAN® model, 2022 AEDS Data, using inputs provided by the user and IMPLAN Group LLC, IMPLAN System (data and software), 16905 Northcross Dr., Suite 120, Huntersville, NC 28078 www.IMPLAN.com

Appendix

Detailed analytical framework

Our analysis focuses on the active involvement of African immigrants in all aspects of the local economy. The analysis considers the intricate relationships between different sectors, where the output from one sector can serve as the input for another and vice versa. To fully consider the impact of end consumers, our model must explain the complex dynamics between businesses and households. Businesses and households interact within two key markets: the market for goods and services production, and the market for labor and access to capital resources. Our model should be able to depict or reasonably assume the consumption and production patterns of businesses and households resulting from this ongoing interaction. The description provided by our model primarily relies on the supply and/or demand of final products.

IMPLAN software

All of the modeling and economic impact analysis in this study, from the construction of the models for AEDS to the calculation of total output multipliers for nonprofit sectors, was performed using IMPLAN, a computer software package that builds and evaluates input-output models for economies at the local, regional, and national levels.

We used the IMPLAN calculation process to estimate the economic impact of AEDS expenditures in the regional economy since 2009. The preceding estimations and assumptions were made outside of IMPLAN to evaluate the initial or direct effect of AEDS expenditures in the region.

Leontief's input-output model

Leontief's input-output model[2] provides the basis for our analysis. The input-output model is derived from a production function (Figure A1). A production function describes the relationship between inputs and outputs in an economy (Clouse, 2020).

A general production function explains the underlying components responsible for economic output.

Figure A1. Production Function

$$\mathbf{Q} = \boldsymbol{f}(\mathbf{K}, \mathbf{L})$$

[2] Initially developed by Nobel laureate Wassily Leontief in the 1930s the model represents the relationships between inputs and outputs across various industries, illustrating how the production of goods and services in one sector relies on inputs from other sectors.

where financial capital (K) and labor (L) combine to enable the production of some quantity (Q) of output. Although there are a few basic types of production functions, our analysis is rooted in Leontief's version where the relationship between capital (K) and labor (L) look like the following:

Figure A2. Leontief production function

$$\mathrm{Q} = \min(\mathrm{aK}, \mathrm{bL})$$

where some quantity (Q) of economic output still comes about by combining financial capital (K) and labor (L), but combining them in a more specific way. This model assumes that capital and labor are perfect complements to one another and thus cannot substitute for one another. Simply, a working person cannot be fully replaced by the tools they use to do their jobs no matter how sophisticated the tools are. This assumption has both consequences and advantages. Consequently, the model assumes increasing inputs (i.e., capital and labor) will lead to proportional (i.e., one-to-one) increases in output. This is called **constant returns to scale**. In other words, to double product output requires a doubling of both the workers and the equipment they use to do their jobs. This assumption also locks the model such that there is only as much output (Q) as the previously described relationship between capital (K) and labor (L) will allow. (Clouse, 2020)

The model looks at the regional economy as a system of interrelated industrial sectors (Wainwright & Chiang, 2005). They are interrelated because one sector's output is used as another sector's input, and may also find its way into the final demand by households. Therefore, each industry is potentially the producer of an intermediate input that may also be consumed in the final demand.

In general, a matrix *A* of order $m \times n$ (*m* rows and *n* columns) can be written as

$$A = \begin{bmatrix} a_{11} & a_{12} & a_{13} & \cdots & a_{1n} \\ a_{21} & a_{22} & a_{23} & \dots & a_{2n} \\ \vdots & \vdots & \vdots & \ddots & \vdots \\ a_{m1} & a_{m2} & a_{m3} & \cdots & a_{mn} \end{bmatrix}$$

where each row represents a sector and each column represents a sector. Further, to express all inputs and demands in terms of dollars, the production vector for the economy is given by

$$\mathbf{x} = \begin{bmatrix} x_1 \\ x_2 \\ \vdots \\ x_n \end{bmatrix}, \mathbf{x} \geq 0$$

The final demand by consumers in money terms for the output of industry *i* is fixed at d_i, so that the final demand vector in its entirety is

$$\mathbf{d} = \begin{bmatrix} d_1 \\ d_2 \\ \vdots \\ d_n \end{bmatrix}, \mathbf{d} \geq 0$$

Using the general matrix *A* to specify the input requirements of each industry, we note that it is necessarily a square matrix meaning simply that equally all industries are represented in both rows and columns. It should also be noted that some industry *j* may not use any of the output of industry *i* as an input and that some industries may require some of their own output to be used as inputs in their production processes. The total money value of the output of industry *i* required by all industries is

$$\sum_{j=1}^{n} a_{ij}x_j = a_{i1}x_1 + a_{i2}x_2 + \cdots a_{in}x_n$$

where $a_{ij}x_j$ is the money value of the output of industry *i* required to produce the x_j units of output of industry *j*. In total, the demands made on the output of all industries can be expressed as

$$A\mathbf{x} = \begin{bmatrix} a_{11} & a_{12} & a_{13} & \cdots & a_{1n} \\ a_{21} & a_{22} & a_{23} & \ldots & a_{2n} \\ \vdots & \vdots & \vdots & \ddots & \vdots \\ a_{m1} & a_{m2} & a_{m3} & \cdots & a_{mn} \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ \vdots \\ x_n \end{bmatrix}$$

Each row is the total demand on the output of industry *i* made by the entire production sector. Then, of course, we have the final demand from the consumption of goods and services from the output of industry *i*, which we can denote as d_i. The economy-wide demand for the output of any industry *i* is given by

$$\sum_{j=1}^{n} a_{ij}x_j + d_i$$

For supply to equal demand in sector *i* it must be true that

$$x_i = \sum_{j=1}^{n} a_{ij}x_j + d_i$$

If all demands in the economy are to be met, this must hold for all *n* industries in the economy such that

$$\mathbf{x} = A\mathbf{x} + \mathbf{d}$$

We can rearrange this to determine what vector of outputs **x** will satisfy supply just meeting demand to get

$$\mathbf{x} - A\mathbf{x} = \mathbf{d}$$

or

$$(I - A)\mathbf{x} = \mathbf{d}$$

substituting the identity matrix I_n as one with its principal diagonals being equal to 1 with zeroes everywhere else. As long as $(I - A)$is nonsingular, the inverse $(I - A)^{-1}$ exists and we may write the solution as

$$\mathbf{x} = (I - A)^{-1}\mathbf{d}$$

This is known as the "Open" Leontief input-output model, because it is open to final demand as a 'sector' outside of the *n* industry network. (Hoy et al., 2011)

By organizing the analysis of the regional economy into a matrix of sector interdependence, this model enables us to compute multipliers, which allow us to calculate AEDS economic impact. This model is useful because it provides us with a basis for aggregating the ripple effects or changes attributable to AEDS contributions through the nonprofit sector on the entire economy. Results incorporate both backward linkages (impacts of input changes on economic output) as well as forward linkages (impacts of output changes on inputs). This model is excellent for studying the effects AEDS programs have had on the regional economy.

We further extend our model of analysis by using a social accounting matrix (SAM) which allows us to calculate additional information on non-market financial flows or industry-to-institution and inter-institution transfers (Richmond et al., 2003). This is important for understanding the economic impact of AEDS because it recognizes that institutional income is also distributed to other institutions. This expands the results beyond businesses and households to include transfers from governments to people, such as through social security, unemployment compensation, and other refunds and benefits. It further accounts for business investment and borrowing as well as household net savings, both key outcomes for AEDS.

Figure A3. Value added

$$\text{Value Added} = \text{Output} - \text{Intermediate Inputs}$$

$$\text{Value Added} = \text{Employee Compensation} + \text{Proprietor Income} + \text{Taxes} + \text{Other Property Income}$$

This approach was motivated by the need to focus on the wider implications of AEDS activities beyond just surpluses or deficits (and in the case of client activities beyond profits or losses) to highlight the wealth created for a much larger group of societal stakeholders. We calculated the direct, indirect, and induced outputs attributable to AEDS programs and added these together to arrive at the total impact. Despite being constructed at a relatively high level of aggregation, AEDS-provided tax filings enabled us to calibrate our results to reasonably precise levels of accuracy.

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The authors would like to thank the staff of the African Economic Development Solutions for their collaboration and sharing the necessary documentation for the cost-benefit analysis.

Thank you also to the following Wilder Research staff who provided support on this project:

Allison Liuzzi, Research Manager

Audrey Mutanhaurwa, Research Assistant

Kerry Walsh, Sr Communications Specialist

Rachel Fields, Research Librarian

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451 Lexington Parkway North
Saint Paul, Minnesota 55104
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