Stocks in the Future: An Examination of Participant Outcomes in 2014-15

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Executive Summary

Stocks in the Future (SIF) is a financial literacy program for students in grades 6 through 8, and though SIF is offered in public and private schools throughout the Baltimore region, this report examines SIF in the context of Baltimore City Public Schools (City Schools). Specifically, student outcomes for school year 2014-15 are analyzed, representing over 700 middle-grades students in 13 City Schools across Baltimore.

The SIF program features lessons throughout the entire school year, is taught weekly by students' regular classroom teacher, and offers incentives aimed at increasing students' attendance, grades, and educational aspirations. The SIF curriculum covers financial life skills such as savings and budget creation, but also covers topics around creating and managing wealth, in particular, about stocks, bonds, mutual funds, stock comparisons, investment risk, profit margins, and trading on the stock market. SIF places a high priority on offering financial literacy instruction to underrepresented groups, especially African-American and socioeconomically disadvantaged students. And in Baltimore, where students' families may be living in poverty because they have been historically excluded from access to the sources of wealth generation (home ownership, banks, etc.), providing this service is especially critical.

SIF is also an incentive program where the central incentive is being able to own and manage a personal stock portfolio, which grows as a student earns investable SIF dollars from perfect attendance and good report card grades. Professionals from local financial institutions also visit SIF classrooms to share experiences from their own careers and to bring greater relevance to what students are learning. The primary goal of the SIF program is to increase students' financial knowledge and create greater attachment to school. SIF aims to make an explicit connection between financial investing and students' investing in their future by coming to school regularly and doing their best academically (R. Lange-Thernes, personal communication, June 1, 2015).

Our analysis finds that in City Schools, SIF serves a student population that is representative of the district as a whole. Nearly 90% of students participating in SIF in 2014-15 were eligible for free and reduced-price meals (FARMS), and 89% were African-American or Hispanic. Sixth grade students, who were new to SIF in 2014-15, showed significant increases in self-reported efficacy with respect to financial and investment know-how by the end of the school year. This suggests that SIF is providing a new generation of students with tools to make sound financial decisions and an awareness of wealth-generating options that will available to them as adults. Through regular manipulation of their stock portfolios, students have useful opportunities to practice the process of studying investment options, considering any risks, and making investment decisions of their choosing and based on their personal interests (e.g., sports-related or travel companies, social media, etc.).

When SIF students' financial and investment knowledge was measured directly using the Hopkins Short Achievement Test (HSAT), we found that relative to students who were not in the SIF program, SIF participants were significantly more likely to gain important investment-related reading comprehension skills. Specifically, 6th and 7th graders showed statistically significant

growth in comprehension, and 7th graders showed significant growth in financial vocabulary and math concepts and calculations, relative to students in comparison schools.

Students in SIF were less likely to be chronically absent by the end of the school year. On average, 24.8% of SIF participants missed at least 10% of their days on roll in 2014-15, while 27.9% of comparison students did so. These differences were not statistically significant, however, which may be partly due to a district-wide pattern of lower student attendance in 2014-15, relating to the civil unrest in Baltimore that spring. More students than usual were chronically absent by the end of the year, not attending school perhaps in part because of concern about further instability in the city. Attendance patterns also did not explain differences between SIF and comparison students in HSAT scores. The most powerful correlate of students' attendance in 2014-15 was their attendance rate for the prior school year, which suggests that attendance habits -- once established -- are particularly difficult to alter.

Based on multiple visits to each SIF classroom over the year and protocol scores assigned by a SIF instructional facilitator, we found differences across schools in fidelity to and implementation of the SIF model. Particularly among 6th grade classes, teachers were behind the intended schedule of SIF lessons by more than two weeks. This was also the case for most 7th grade classes. Some teachers also struggled with lesson clarity, as well as consistent use of the SIF materials and incentives (e.g., completing weekly attendance exercises, using regular reminders about earning SIF dollars for their portfolios with good attendance). Notably, these two aspects of the program were significantly correlated with students' HSAT performance.

These findings point to opportunities for more consistent use of SIF incentives, as well as the need for specific training and ongoing support for SIF teachers. Strategies that help teachers remind students more frequently about the opportunities they have to grow their portfolios and engaging them in the weekly attendance exercise may help motivate students to increase their attendance. As a result, students can gain greater confidence with investments at the same time that they form concrete ideas about the usefulness of completing high school.

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Background

This report features research on Stocks in the Future (SIF), a financial literacy program for middle-grades students. The goals of SIF are to serve underrepresented, socioeconomically disadvantaged students in schools where more than 50% are eligible for free/reduced-price meals, achieve stronger student attendance and greater attachment to school, and to effectively provide instruction in financial life skills and investing. First we discuss the SIF model and other research on similar programming, followed by a description of the data sources used. Next, we provide a statistical analyses to address research questions framed by SIF goals. We conclude with a discussion of the findings and their implications.

The Stocks in the Future Model

Stocks in the Future (SIF) is a financial literacy program for students in grades 6 through 8. SIF serves schools throughout the Baltimore area, including several in each of the geographic quadrants of Baltimore city. For school year (SY) 2014-15, SIF served over 700 6th through 8th grade students in 13 Baltimore public schools. Although SIF is not the only financial literacy program in Baltimore City Schools (City Schools), it is unique and distinctly different from other programs such as Junior Achievement, as SIF programming is year-long, consisting of 20 to 30 weekly sessions tailored to each grade. Further, whereas other financial literacy programs rely exclusively on volunteers, the SIF curriculum is delivered to students by their regular, certified classroom teachers.

SIF is also an incentive program whereby students build personal stock portfolios, buying securities they choose using earned SIF dollars. Students receive investable SIF dollars for each week of perfect attendance and good grades, and these portfolios can be sold or re-invested upon turning 18 and graduating from high school. Also, professionals from local financial institutions visit SIF classrooms throughout the year to share information about relevant career paths and provide real-world context about the investment principles students are learning.

SIF teachers receive full-day professional development on the program's special financial literacy curriculum twice per year. The curriculum features lessons targeted to 24 of the 30 Maryland State Department of Education (MSDE) Common Core standards for financial literacy. These include basic financial life skills like budget-making and saving, but SIF goes further with lessons on stocks, bonds, mutual funds and the stock market. Students learn about ways to grow money, how to understand profit margins and price trends, and practice making stock comparisons. Lessons also include integrated math exercises where students immediately practice calculations using the concepts learned. Essentially, SIF aims to provide rigorous, effective instruction about finance, investing and the means of creating wealth, while simultaneously reinforcing fundamental math skills.

Past Research on Financial Literacy

SIF is especially relevant for many of the families that populate City Schools, because of Baltimore's history of racial discrimination, racial income inequality and deliberate denial of access to banking and wealth accumulation among African Americans (e.g., home ownership, loans, etc.) (Massey, 2015; "How Racism Doomed Baltimore," 2015, p. SR10). Research nationally has shown how the systematic denial of access to basic sources of wealth, and forced reliance on dodgy, exploitive contracts has transmitted extreme disparities in intergenerational household wealth between Whites and African Americans over decades (c.f., Conley, 1999; Oliver & Shapiro, 2006). The central premise of SIF programming is to directly equip the populations affected by this legacy with tools to address the effects of this historical discrimination.

Financial literacy is critical, now more than ever in an era when exploitive lending practices and investment scams abound, and especially for youth as student loan debt now exceeds credit card debt (Federal Reserve Board, 2010 cited in Houle, 2013). Recent research suggests that less than one-third of American adults aged 23 to 28 are familiar with basic financial concepts (Lusardi, Mitchell, & Curto, 2010). Research also demonstrates that girls are less likely than boys to possess competency (Lusardi et al., 2010; Lusardi & Tufano, 2009), and that Whites are significantly more financially literate than African-American or Hispanic/Latino individuals (Lusardi et al., 2010). Such findings emphasize the importance of earlier and more frequent exposure to financial curricula for creating a more prosperous and equitable citizenry.

In a national survey conducted in 1997-98 by the National Endowment for Financial Education, high school students were asked about their financial behaviors, knowledge, and confidence with managing money before receiving a High School Financial Planning Curriculum, and again afterwards. Results demonstrated that students were positively affected by the program, as suggested by self-reported levels of efficacy and newly established savings accounts (Boyce et al., 1998). Comparable programs provided to young adults have had similar impacts, such as employees establishing new 401(k) accounts after employer-sponsored financial training (Bernheim & Garrett, 2003; Garman, Kim, Kratzer, Brunson, & Joo, 1999), lower mortgage default rates for those participating in pre-home buying financial courses (Hirad & Zorn, 2001), and greater financial wealth in adulthood as a result of state-mandated financial literacy curriculum (Bernheim, Garrett & Maki, 2001).

Particularly interesting are study findings showing that with regard to financial training, perceived risk negatively affected an individual's propensity to engage in new behaviors (Mullainathan & Thaler, 2000). Thus, programs such as SIF that provide information and an opportunity to experiment with investments without real financial risk may be especially beneficial for developing awareness and confidence with financial management among youth.

In research measuring impacts of financial literacy programs, the definition of success varies, but in general most studies aim to measure whether the curriculum and programming result in students' ability to make better financial decisions (Braunstein & Welch, 2002). While such outcomes for SIF participants cannot be determined, this report details several more proximal indicators. Specifically, we examine self-reported confidence and knowledge about investment and finance as measured via student surveys and direct assessments of financial knowledge and ability. We also measure the effectiveness of SIF incentives by examining participants' attendance.

Methodology

The research questions were derived from the SIF framework (shown in Appendix A).

Research Questions

- What are the characteristics of schools and students participating in SIF, in relation to SIF's target population recruitment goals? What are the characteristics of students in comparison schools?
- What are participants' attendance patterns relative to non-SIF students in comparison schools?
- Do SIF students' perceptions of their educational self-efficacy and attachment to schooling increase during the school year?
- Does participants' financial literacy as measured via the Hopkins Short Achievement Test (HSAT) increase between fall and spring?
- Are there differences in financial literacy learning between SIF students and those in comparison schools as measured by the HSAT?
- Can differences in HSAT outcomes be explained by classroom differences in implementation of SIF? Student attendance?

Data Sources and Analysis

Most data were collected over the course of SY 2014-15 by SIF staff, specifically the classroom visit scores, the HSAT, and student responses to a survey gauging their self-efficacy, perceived utility of school, and the value they place on investment knowledge. These data are collected every year by SIF staff for formative, internal program improvement. The HSAT is a grade-normed assessment developed by education research faculty at Johns Hopkins University measuring ability in four domains: financial vocabulary, text comprehension (in the context of investments), math concepts, and calculations.

The HSAT and survey are administered at the beginning (pre) and again at the end of the year (post). Students in comparable schools were also administered the HSAT during both pre- and post-testing occasions. For the current study, these regularly collected data were utilized along with administrative data for SY 2014-15 that were provided by City Schools. Administrative student-level data included school membership, student grade level, attendance records, service receipt and demographic characteristics such as gender, race, and ethnicity.

Comparable schools were identified according to the percent of students eligible for free/reduced-price meals (FARMS), the percent who are English language learners (ELL), and performance on the Maryland School Assessment (MSA) in 2013-14. These schools were approached by SIF with

a request to take part in the study in return for a subsidy towards purchasing the SIF program in a forthcoming school year.

Descriptive and multivariate methods were used to analyze data in response to the research questions above. For attendance, survey, and HSAT outcome analyses, mean comparisons are shown, but tests of statistical significance were performed using linear and logistic regression to control for student characteristics, with standard errors adjusted using the Huber/White estimator in STATA to account for clustering of students within schools. (Full regression results are provided in Appendix B.)

Definitions

Average Daily Attendance (ADA) is a measure of the number of days a student was present in school divided by the total number of days they were on the roll.

Chronic Absence is a student-level summary indicator that s/he was absent 10% or more of total days enrolled in City Schools during a given school year.

SIF "participants" are defined by having an SIF-collected pupil ID that was able to be matched to a record in the City Schools administrative data, as well as having a valid HSAT test score, either pre or post testing occasion, or by participating in the student survey.

Limitations

Results may be biased due to missing or incorrect data, namely when the reason for the missing data point (e.g., absence on the day HSAT or survey was administered) is related to performance on the HSAT. SIF or comparison students were excluded when relevant data were unavailable. Erroneous data, particularly incorrectly recorded pupil IDs or school identifiers may also impact results.

The HSAT has not been studied for validity or reliability, and the pre/post-test design may be subject to retest bias. A new SIF skill assessment is in development in collaboration with University of Maryland's School of Business but was not available for use in the current study.

None of the analyses can control entirely for unobserved factors that are also related to student outcomes; thus, the findings should be considered descriptive and cannot be considered evidence of causation. Also the term "statistically significant" implies not that the results are generalizable to a broader population, but instead indicates a level of statistical variation between groups that is larger than that within groups.

Findings

In the following section, we present findings to the research questions above.

Characteristics of SIF Schools

One of the aims of SIF is to provide investment and financial literacy to students in underrepresented or socioeconomically disadvantaged schools. In Table 1, we show participating schools, grades served, the percent of students eligible for free and reduced-price meals (FARMS), the percent qualifying for English Language Learning services (ELL), and the percent African-American and Hispanic. We found that SIF student profiles are similar to that of the district as a whole, with comparable shares eligible to receive ELL services and identifying as Hispanic. However, SIF students were somewhat less likely to identify as African-American (82.5% versus 84.4%) and slightly more likely to be FARMS-eligible than other district students in 6th through 8th grade (88.5% versus 87.9%).

Table 1
Participating 2014-15 SIF Schools and Demographic/Service Characteristics of Students Served

	N	Grade levels Served	% FARMS	% ELL	% Afr-Amer	% Hispanic
Arlington E/M	26	7th	92.3	0.0	96.2	≤ 5.0
Barclay E/M	87	6th, 7th	95.4	0.0	96.6	0.0
Bay-Brook E/M	11	6th	100.0	18.2	63.6	18.2
Cross Country E/M	55	6th, 7th	85.5	≤ 5.0	90.9	7.3
Fallstaff E/M	113	6th, 7th, 8th	86.7	19.5	69.9	24.8
Hamilton E/M	27	6th	74.1	0.0	85.2	≤ 5.0
Hampden E/M	67	7th	82.1	0.0	32.8	≤ 5.0
Henderson-Hopkins	54	6th, 7th	92.6	0.0	100.0	0.0
InnHarborEast Acad	60	6th, 7th, 8th	86.7	0.0	100.0	0.0
MD Acad Tech/Hlth	46	6th, 7th, 8th	93.5	0.0	100.0	0.0
Thomas Jefferson E/M	90	6th, 7th, 8th	83.3	0.0	97.8	≤ 5.0
Violetville E/M	51	8th	92.2	11.8	51.0	13.7
Waverly E/M	27	6th	100.0	0.0	92.6	≤ 5.0
Total:						
All SIF Schools	714	6th, 7th, 8th	88.5	≤ 5.0	82.5	6.6
District Average	17,050	6th, 7th, 8th	87.9	≤ 5.0	84.4	6.2

Note. N is the count of students included in the analysis. Due to missing data, some SIF students in 2014-15 are not represented in the current study. District averages were obtained from mdreportcard.org.

Characteristics of Participants

Featured in Table 2 is additional student demographic and service information by grade level. We note that 8th grade SIF students were less likely to identify as African-American, and were somewhat less likely qualify for FARMS than those in 6th and 7th grades, but 8th graders were over three times as likely to receive ELL services. (See Appendix Table B.1 for similar details on students in comparison schools.)

Table 2
Characteristics of 2014-15 SIF Students by Grade Level

	6th	7th	8th	All Participants
Demographic				
% Male	49.6	50.2	53.2	50.7
% Female	50.4	49.8	46.8	49.3
% African-American	90.8	84.4	65.9	82.5
% White	9.2	15.6	34.1	17.5
% Hispanic	6.0	4.3	11.0	6.6
Service Receipt				
% FARMS	90.1	90.3	83.2	88.5
% ELL	2.8	2.7	9.2	4.3
Number of Students	284	257	173	714

Attendance Patterns of SIF and Comparison Students

Average Daily Attendance (ADA) and the percent of students chronically absent in 2014-15, by grade and SIF participation are shown in Table 3. All SIF participants were present for an average of 92.6% of the school year, while 24.8% were chronically absent. This compares to 92.0% ADA and nearly 27% of students chronically absent in comparable schools. Among both 7th and 8th grade SIF participants, ADA was higher than for comparison students, and their rate of chronic absence was lower, though not significantly different. (See Appendix Tables B.2 and B.3 for detailed results of regression analyses.)

Table 3
Average Daily Attendance (ADA) and Chronic Absence in 2014-15
by Grade and SIF Participation

	SIF	Comparison
6th Grade		
ADA	92.7	93.0
% Chronically absent	25.7	20.8
7th Grade		
ADA	92.5	91.5
% Chronically absent	23.0	27.9
8th Grade		
ADA	92.6	91.6
% Chronically absent	26.0	31.7
All Students		
ADA	92.6	92.0
% Chronically absent	24.8	26.9
Number of Students	714	245

Student Survey on Financial Literacy and Self-Efficacy

At the beginning and end of the year, SIF participants were invited to complete a survey that measured four constructs: general self-efficacy, perceived utility of school, their value and use of investment knowledge, and self-efficacy in investing and financial knowledge. For general self-efficacy, for example, students rated their agreement to statements such as "I remember things easily" and "I am just as smart as other kids my age." (See Appendix C for survey constructs, questions, and scale reliability.)

Table 4
Percent of 2014-15 SIF Participants Who Agree or Strongly Agree
by Survey Construct and Grade

	6th Graders		7th Graders		8th Graders		All SIF Participants	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
General Self-Efficacy	85.1	82.8	83.9	85.3	87.8	86.7	85.3	84.7
Perceived Utility of School	89.0	88.5	89.5	88.4	87.7	84.8	88.9	87.6
Value and Use of Financial Knowledge	68.9	70.7	68.5	68.4	67.3	69.8	68.3	69.6
Financial and Investment Self-Efficacy	64.7	71.4*	72.3	73.2	71.4	72.1	69.1	72.3*

*p<.05

Percent agreement with questions comprising each dimension, and groups for which students' level of agreement increased between pre- and post-testing occasion are shaded for clarity in Table 4. For the most part, students' agreement to questions about their sense of general self-efficacy did not change or declined slightly during the school year, although 7th graders' agreement with these questions increased. These differences from beginning to end of the year were not statistically significant, however. Concerning perceived utility of school, the percent who agreed declined across all grades; yet, these declines were also not statistically significant, nor were changes of agreement regarding their value and use of financial knowledge.

Most importantly, the change in agreement with statements about financial and investment self-efficacy represented a statistically significant increase among all SIF participants, and especially among 6th graders. (Full regression results are available in Appendix Table B.4.)

HSAT Performance

To measure whether students' financial literacy, knowledge about investments, and their ability to solve financial math problems increased over the year, SIF participants and comparison students were administered the HSAT before the 2014-15 program began and again at the end. In Table 5 we present average increases in test scores for each group, by grade level.

We found that relative to the students in comparison schools, participation in SIF was associated with significant increases in HSAT scores for several groups and subjects. In particular, 7th grade SIF participants scored significantly higher than comparison students in each tested subject except

comprehension, whereas 6th and 8th grade SIF participants scored significantly higher in comprehension than comparison students. For the most part, SIF participants demonstrated growth in the financial and investment knowledge and skills measured via the HSAT, while comparison students largely demonstrated a decline. (See Appendix Tables B.5 through B.8 for detailed results of regression analyses.)

Table 5
Average Pretest to Posttest Change in Percent Correct on the HSAT among 2014-15 SIF Participants and Comparison Students, by Grade Level and HSAT Subject

	6th Grade (N=220)	7th Grade (N=220)	8th Grade (N=126)	Total (N=566)
Vocabulary				
SIF Participants	-7.37	15.37*	14.77	6.37
Comparison	-1.54	0.22	8.46	0.69
Comprehension				
SIF Participants	-0.18*	4.76	10.03*	4.10
Comparison	-1.39	0.37	-3.85	-0.89
Math				
SIF Participants	-0.73	6.71*	15.29	5.87
Comparison	-1.85	-11.67	-9.09	-7.55
Total				
SIF Participants	-2.82	9.39*	14.00	5.73
Comparison	-1.65	-4.84	-1.27	-3.12

*p<.05

Classroom Observations

Classroom visits by an instructional facilitator to provide timely feedback to SIF teachers regarding their implementation of the SIF curriculum and model are an essential component of the SIF program. A protocol was developed to guide the classroom visit and frame the feedback cycles between the facilitator and the teacher. The protocol offers a rubric, scored between 1 and 3, for elements of the SIF model and other classroom dynamics (e.g., student behavior management and engagement). A score of 3 indicates an observation of virtually perfect fidelity to the "ideal," while a score of 2 indicates medium fidelity, and 1 indicates little or no fidelity. (See Appendix D for further details about the classroom visit protocol.)

The percentage of classroom visits achieving a score of 3 (good fidelity) for each observed element is provided in Table 6. Across all classrooms, the dimension scoring the highest was creation of an orderly classroom environment (85.9%). This dimension captures quick transitions, indicating appropriate use of limited time. The next highest scoring dimension was lesson relevance (84.1%), measuring instances where the teachers deliberately connected SIF concepts to the students' lives, as well as acknowledged their ideas and input respectfully. The dimension with which most classrooms struggled was keeping up with the intended SIF lesson schedule. Approximately 37% of classrooms observed were behind schedule by several weeks.

Table 6
Percent of Classroom Visits Reflecting Fidelity to the SIF Model in 2014-15

Components of the Classroom Visit Protocol:	6th Grade	7th Grade	8th Grade	All Classrooms
Staying on schedule	27.3	41.2	57.1	37.0
Orderly classroom	88.6	85.3	78.6	85.9
Lesson clarity	49.0	53.1	55.1	51.8
Lesson relevance	80.3	90.2	81.0	84.1
Student Involvement	77.3	78.8	85.7	79.1
Use of SIF incentives & materials	82.7	77.6	75.5	79.2
Number of Classroom Visits	22	17	7	46

In further analysis not presented in these tables, we also tested whether classroom dimension scores were related to growth in HSAT scores. Although we found no clear association between increases in HSAT and staying on schedule, orderly classrooms, lesson relevance, or student involvement, we did find a significant and positive relationship between HSAT gains and use of SIF incentives and materials ($r = .522$, $p<.000$), as well as lesson clarity ($r = .616$, $p<.000$). In other words, since a correlation of $r = 1.0$ suggests a perfect relationship, differences in these two factors across schools accounted for more than half of the differences between schools in students' test score change from the beginning to the end of the year.

Summary and Discussion

The preceding analysis was conducted to ascertain whether SIF meets its goals of enrolling underserved students in high-poverty schools, improving student attendance through the use of incentives, and whether students demonstrated increases in self-efficacy with financial and investment knowledge, as well as increases in their value and use of these concepts. We also assessed whether students gained skills and understanding of financial concepts as measured via the HSAT, a grade level-specific assessment of financial literacy abilities. We measured implementation and outcomes for 2014-15 using SIF survey and classroom visit protocols, and City Schools administrative data on student attendance and other background characteristics.

First, SIF serves a diverse, high-poverty population of students in grades 6 through 8, as demonstrated by the percent of participants receiving ELL services, FARMS, and who identify as racial and ethnic minorities. Compared to the district as a whole, SIF participants were slightly more likely to be eligible for FARMS (88.5%), but they identified as Hispanic and received ELL services at a similar rate as other City Schools students (approximately 6%).

While we did not detect significantly higher attendance rates among SIF participants, on average students in 7th and 8th grade were chronically absent at lower rates than students in comparable schools and demonstrated higher ADA for the school year. Establishing strong attendance during the middle grades is crucial, as this is when students may begin to disengage from school and strongly predicts attendance habits during high school. Indeed, in regression analysis, we found that students' attendance rate from 2013-14 was the strongest determinant of their attendance for 2014-15. It should also be noted that the findings regarding students' attendance may have been negatively impacted by the instability in Baltimore during and after the civil uprising occurring as a result of the death of Freddie Gray in April 2015. Year-end attendance rates, like those utilized in the current analysis, were lower than usual for 2014-15 in City Schools as a whole (MSDE, 2016).

Both at the beginning and end of the year, students completed surveys measuring their sense of self-efficacy, perceived utility of school, the extent to which they valued and used the financial knowledge they were learning, and feelings of self-efficacy with respect to investing and financial know-how. No significant change in students' general self-efficacy, value of schooling or value and use of financial knowledge was found. However, it is notable that among 6th grade SIF participants, self-efficacy around financial and investment knowledge significantly increased during the year. Since 7th and 8th graders who had participated in SIF in prior years had taken an identical survey before, their results may be subject to a ceiling effect. Thus, given that 6th grade represents SIF participants' initial exposure to the curriculum and the survey, growth among 6th graders on this measure suggests that SIF students gain a significant boost in their awareness and perceived understanding of financial and investment information as a result of participating in SIF. This is a promising indicator that SIF students are being better equipped with the awareness and skills to make sound financial and wealth-building decisions in the future.

To determine whether SIF is successfully conveying the financial literacy curriculum, we measured student ability with these concepts and skills both at the beginning and end of the school year, and we compared their performance with that of students in similar schools who did not participate in SIF. With only a few exceptions, SIF students showed growth in their understanding of financial and investment vocabulary, reading comprehension, and math problems involving

financial concepts. Among 7th graders especially and compared to comparison students, SIF participants demonstrated significantly higher levels of mastery. SIF 8th grade students also showed significantly higher increases in their reading comprehension of financial and investment topics.

In detailed analyses, we noted that several factors were helpful for explaining differences in students' HSAT performance. We found no consistent relationship between student attendance and HSAT scores, but in some instances, HSAT performance was significantly related to student survey responses. This was particularly the case among 7th graders, for whom self-reported efficacy was positively related to HSAT scores at the end of the year.

There were clear associations between students' HSAT performance and implementation of the specialized SIF curriculum. Across all classroom instructional visits, some classrooms represented greater coherence and fidelity to the SIF curriculum and use of central components of the program. Specifically, there was a moderate correlation between HSAT scores and lesson clarity, but an even stronger relationship between students' HSAT scores and regular use of SIF incentives and materials. These findings suggest that more consistent implementation of the SIF program along with greater emphasis on the incentives it offers may promote greater mastery of SIF's financial literacy learning goals.

Some teachers, especially in classrooms where lesson clarity was observed to be inconsistent, may also benefit from more frequent visits from SIF's instructional facilitation staff who can guide them toward having more coherent, clear lesson delivery strategies. SIF facilitators may also find it useful to identify those grades or classrooms where HSAT performance did not significantly increase during the year and work closely with those teachers to support more consistent use of the SIF material and exercises, as well as provide strategies that have reliably engaged students in the past (e.g., managing their online portfolios more frequently and/or holding classroom or school competitions).

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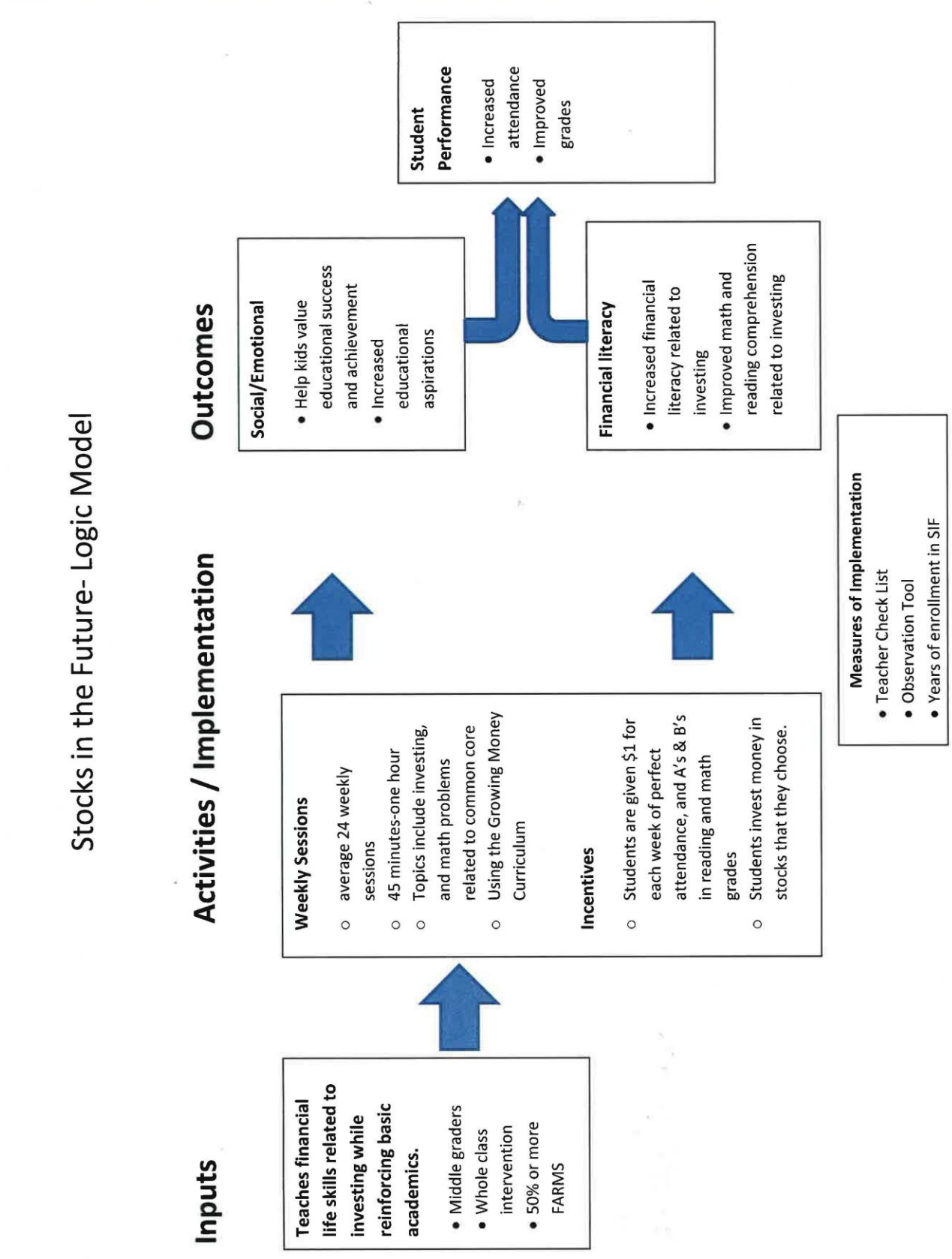
Appendix A. Stocks in the Future Theory of Action



Appendix B. Detailed Analytical Results

Table B.1
Comparison of SIF Participants by Grade and Comparison Schools and Students

	Grade Level			All SIF Participants	Comparison Students
	6th	7th	8th		
Demographic					
% Male	49.6	50.2	53.2	50.7	54.3
% Female	50.4	49.8	46.8	49.3	45.7
% African-American	90.8	84.4	65.9	82.5	66.9
% White/Asian	9.2	15.6	34.1	17.5	33.1
% Hispanic	6.0	4.3	11.0	6.6	5.3
Service Receipt					
% FARMS	90.1	90.3	83.2	88.5	88.6
% ELL	2.8	2.7	9.2	≤ 5.0	≤ 5.0
MSA 2013-14					
% Prof/Adv Reading	59.8	61.3	59.3	60.1	54.1
% Prof/Adv Math	42.0	27.8	32.3	34.2	32.9
Total N	284	257	173	714	245

Note. Maryland School Assessment (MSA) data were obtained from mdreportcard.org.

Attendance Regression Results.

Table B.2
Regression of 2014-15 Average Daily Attendance on SIF Participation and Student Characteristics

	6th Grade		7th Grade		8th Grade		All Students	
	Coef	S.E.	Coef	S.E.	Coef	S.E.	Coef	S.E.
Intercept	43.54	5.49	27.23	7.86	18.64	7.35	30.20	6.35
SIF Participant	-1.73	1.04	.38	.78	-.89	.71	-.78	.40
FARMS	-1.38	.71	-.44	.72	.24	.69	-.56	.41
Special Ed Svcs	-.85	1.32	-1.62	1.40	.04	1.77	-1.03	.75
Male	-.79	.48	-.27	.83	-.25	.43	-.48	.39
African-American	-1.08	.88	1.19	1.41	.12	.45	-.06	.51
ADA, 2013-14	.56*	.06	.70*	.09	.80*	.08	.68*	.07
N	361		343		255		959	
R-square	.23		.33		.63		.36	

* p<.05

Table B.3
Regression of Chronic Absence on SIF Participation and Student Characteristics, 2014-15

	6th Grade		7th Grade		8th Grade		All Students	
	Log-odds	S.E.	Log-odds	S.E.	Log-odds	S.E.	Log-odds	S.E.
Intercept	-2.54	.57	-1.24	.56	-2.48	.50	-1.99	.26
SIF Participant	.64	.34	-.29	.34	.30	.47	.19	.17
FARMS	.11	.30	.13	.47	.04	.37	.10	.21
Special Ed Svcs	.36	.61	.69	.41	.77	.78	.57*	.23
Male	.35	.19	-.10	.30	-.22	.46	.08	.18
African-American	.18	.43	-.77*	.24	-.02	.39	-.19	.19
Chr Abs, 2013-14	2.07*	.26	2.43*	.40	3.32*	.62	2.49*	.28
N	361		343		255		959	
Pseudo R-square	.12		.21		.36		.20	

* p<.05

Student Survey Regression Results.

Table B.4
Regression of 2014-15 Student Post-Survey Dimensions on Student Background Characteristics

	General Self-Efficacy		Utility of School		Value of Fin Knowledge		Fin/Invest Self-Efficacy	
	Coef	S.E.	Coef	S.E.	Coef	S.E.	Coef	S.E.
Intercept	.40	.07	.52	.07	.28	.03	.36	.06
Pre-Survey response	.53*	.07	.41*	.07	.42*	.04	.42*	.07
FARMS	.00	.02	.02	.03	.08	.04	.04	.03
Special Ed Svcs	-.05	.03	-.01	.03	.00	.03	-.02	.03
Male	.02*	.01	.00	.01	.04*	.02	.02	.02
African-American	-.00	.03	-.02	.02	.02	.02	.03	.02
Chronically absent in 2014-15	-.02	.02	-.01	.02	.04*	.01	-.01	.02
N	472		473		422		409	
R-Square	.30		.12		.20		.20	

*p<.05

HSAT Regression Results.

Table B.5
Regression of HSAT Scores on SIF Participation, Student Characteristics and Survey Responses, 6th Graders Only (N=165)

	Vocabulary		Comprehension		Math		Total Score	
	Coef	S.E.	Coef	S.E.	Coef	S.E.	Coef	S.E.
Intercept	-24.03	38.51	-67.71	51.97	-51.34	29.49	-52.42	32.97
Pretest score	.40*	.14	.47*	.11	.69*	.11	.76*	.12
SIF Participation	-1.99	9.63	7.41	5.03	5.36	5.49	4.30	6.71
FARMS	-3.62	3.11	.23	4.49	1.54	4.08	.11	2.67
Special Ed Svcs	-24.52*	9.57	-8.48	12.12	-9.15	8.32	-12.65	7.22
Male	-4.90	4.08	-3.79	3.42	-3.23	3.49	-3.76	3.15
African-American	-6.77	3.05	-17.14*	6.02	-10.11	6.84	-10.66*	4.40
Gen self-eff	-1.50	14.39	-6.71	14.26	-10.19	11.59	-13.31	10.60
Value of school	-19.22	28.50	-14.79	30.25	-14.50	23.93	-14.72	24.97
Value fin knowlg	6.60	11.72	-1.57	17.53	10.50	8.92	8.45	9.96
Fin self-eff	3.06	10.60	31.01	23.49	9.36	13.43	15.13	13.56
ADA, 2014-15	1.04	.60	1.15	.57	.85	.47	.87	.48
R-square	.21		.27		.39		.39	

* p<.05

Table B.6
Regression of HSAT Scores on SIF Participation, Student Characteristics and Survey Responses 7th Graders Only (N=162)

	Vocabulary		Comprehension		Math		Total Score	
	Coef	S.E.	Coef	S.E.	Coef	S.E.	Coef	S.E.
Intercept	5.98	14.94	-6.03	34.37	1.10	21.12	-8.47	8.17
Pretest score	.26*	.11	.20	.12	.44*	.09	.49*	.15
SIF Participation	19.05*	5.23	1.56	4.71	13.78*	5.56	12.30*	5.02
FARMS	-8.05	4.48	-1.40	6.45	4.92	10.29	-.97	5.97
Special Ed Svcs	-5.91	3.77	-12.38*	3.96	-4.78	3.24	-4.56	2.60
Male	-3.22	4.10	-1.57	3.95	-6.19	4.05	-4.37	2.68
African-American	-5.62	5.60	.15	4.83	-3.03	5.37	-5.48	4.98
Gen self-eff	48.05*	14.04	13.00	13.32	33.25	16.38	30.55*	13.31
Value of school	-6.19	13.40	.03	14.29	4.16	10.73	-.90	8.78
Value fin knowlg	-4.81	10.08	-16.61	9.92	-4.26	8.17	-4.15	7.62
Fin self-eff	-2.09	11.29	2.69	16.18	-5.08	13.45	-1.31	8.17
ADA, 2014-15	.15	.21	.44	.30	-.05	.31	.16	.18
R-square	.32		.12		.28		.36	

* p<.05

Table B.7

Regression of HSAT Scores on SIF Participation, Student Characteristics and Survey Responses, 8th Graders Only (N=101)

	Vocabulary		Comprehension		Math		Total Score	
	Coef	S.E.	Coef	S.E.	Coef	S.E.	Coef	S.E.
Intercept	85.41	28.79	50.04	24.68	-36.19	81.93	29.33	41.64
Pretest score	.07	.16	.10	.11	.14	.20	.09	.19
SIF Participation	7.76	5.95	14.74*	3.48	21.99	16.51	14.74	7.74
FARMS	-5.45	2.29	-7.96	4.06	-5.34	4.03	-5.93	2.88
Special Ed Svcs	-9.23	5.11	-6.05	7.91	-6.31	6.12	-7.29	3.03
Male	1.46	4.60	1.62	4.32	-3.39	6.68	-.51	4.75
African-American	-5.31	6.34	-4.90	5.60	-8.20	10.47	-6.53	7.79
Gen self-eff	-.09	28.64	4.20	18.81	26.40	20.01	11.14	22.44
Value of school	8.80	9.06	7.34	10.76	43.44	22.34	22.77*	8.00
Value fin knowlg	-22.65	13.97	-11.34	8.76	-37.32	14.54	-25.74*	9.98
Fin self-eff	7.44	6.33	11.43	10.88	10.75	15.12	9.59	8.33
ADA, 2014-15	-.28	.27	-.10	.18	.34	.65	.01	.37
R-square	.09		.09		.28		.21	

* p<.05

Table B.8

Regression of HSAT Scores on SIF Participation, Student Characteristics and Survey Responses, All Students (N=428)

	Vocabulary		Comprehension		Math		Total Score	
	Coef	S.E.	Coef	S.E.	Coef	S.E.	Coef	S.E.
Intercept	10.13	24.30	-21.76	28.18	-29.00	23.49	-13.37	18.66
Pretest score	.35*	.09	.35*	.10	.39*	.13	.39*	.16
SIF Participation	8.50	6.90	5.26	4.98	9.89	6.92	8.26	6.04
FARMS	-5.15	2.74	-2.36	3.62	.67	4.15	-1.99	2.74
Special Ed Svcs	-13.13	4.05	-9.40	4.44	-7.39*	3.15	-9.64*	2.94
Male	-2.81	2.02	-.87	2.31	-4.52	2.07	-3.14*	1.34
African-American	-3.14	3.63	-6.68	4.15	-9.83	6.94	-7.02	4.79
Gen self-eff	13.65	10.51	7.58	9.20	23.65	10.59	15.87	9.59
Value of school	-1.98	13.16	-6.46	15.44	5.71	11.54	-.39	11.07
Value fin knowlg	-1.56	6.34	-8.60	7.45	-10.56	8.41	-7.16	5.98
Fin self-eff	.43	5.60	14.04	10.83	3.24	9.92	5.52	7.52
ADA, 2014-15	.32	.28	.60	.31	.45	.24	.43	.21
R-square	.23		.17		.25		.27	

* p<.05

Appendix C. Student Survey Questions

General Self-Efficacy (Pre/Post Reliability Alpha = .71/.72)

1. I am good at my schoolwork.
2. I remember things easily.
3. I am just as smart as other kids my age.
4. I can do the work in my classes.
5. We do many things in school that I can do well.
6. Sometimes I feel like the work I do at school is too hard for me (reverse coded).
7. I feel in control over who I can become in the future.

Perceived Utility of School (Pre/Post Reliability Alpha = .50/.62)

1. I will be able to use what I learn at school later in life.
2. To be a successful adult I need to try hard in school.
3. The reason I keep coming to school is because education is important for the goals I have.
4. It is important that I go to college.
5. Students who get poor grades in school can still get a job that pays well (reverse coded).

Value and Use of Financial Knowledge (Pre/Post Reliability Alpha = .55/.61)

1. It is important to learn how to manage money.
2. I put money into a savings account at a bank.
3. I pay attention to the news about the stock market and business in this country.
4. I would like to own my own business one day.
5. I talk with my family about business news.
6. I would like to own stocks when I am an adult.
7. I keep most of my money in my wallet or in my home (reverse coded).

Financial and Investment Self-Efficacy (Pre/Post Reliability Alpha = .68/.68)

1. I can talk about financial issues or concerns with a family member.
2. I am better than most kids my age at saving money.
3. I understand what stocks are.
4. I know more about earning money than my classmates.
5. I understand things like sales growth and profit margin.
6. I know about many different ways to save money (e.g., savings accounts, bonds, stocks, and mutual funds).
7. I feel confident that I can invest in the stock market.
8. I am unsure why a stock might go up or down (reverse coded).
9. Compared to other kids at school I am more likely to talk about business news.

Appendix D. Classroom Visit Protocol

The protocol for SIF classroom visits was developed collaboratively by BERC researchers and SIF leadership. It was developed for use by the SIF instructional facilitator(s) during their regular visits to all SIF classrooms, ideally occurring at least four times over the course of the school year, i.e., once per quarter. The protocol captures fidelity to the SIF curriculum and schedule, classroom and student behavior management, and use of the SIF materials and incentives. The protocol includes 19 indicator statements, which the facilitator scores between 1 and 3, where 3 indicates virtually perfect fidelity, 2 reflects moderate fidelity, and 1 indicates little or no fidelity. The protocol also includes a checklist for the presence of particular aspects of the SIF program, for which the facilitator provides scores of 1 (present) or 0 (not present). Table D.1 presents the "ideal" statement for each indicator on the protocol, or those that would receive scores of 3. The statements are organized according to the dimensions presented in the report, specifically: staying on schedule, orderly classroom, lesson clarity, lesson relevance, student involvement, and use of SIF materials and incentives.

Table D.1
Classroom Visit Protocol Statements and Indicators

On Schedule	• "Teacher is exactly on schedule (or ahead) with the SIF lesson calendar."
Orderly Classroom	• "Materials were quickly distributed which led to prompt beginning of the lesson." • "Students proved their awareness of a class routine by quickly passing out/getting out materials without prompting by teacher."
Lesson Clarity	• "It was clear that the teacher knew the lesson and only used SIF Teacher Edition as a quick reference." • Teacher consistently conveyed accurate content throughout the entire lesson." • Teacher delivered the lesson in an appropriate sequence, making the objective clear." • "Towards the end of the lesson, the teacher drew students into an active summary of the lesson objective." • (checklist) "Teacher introduced the lesson objective(s) before beginning the new lesson." • (checklist) "Teacher used the SIF Power Point slides to present the lesson, or used other graphic materials." • (checklist) "Students used their SIF workbooks during the lesson."
Lesson Relevance	• "Teacher confidently conveyed content, plus s/he elaborated with real-world information or examples to make lesson more relevant to students." • Teacher was responsive to students, and built off the ideas they presented in class that were related to the lesson." • "Teacher acknowledged, and was respectful of all students' relevant ideas and statements."

Student Involvement	• "The learning activity could be characterized as having frequent learning-related interaction between the teacher and the students." • "The teacher structured the lesson with a variety of instructional modes (i.e., large group, small group, or individual work)." • "During class time, the teacher frequently circulated around the classroom to maintain focus, and to ensure comprehension and completion of written work." • "Students appeared to be enthusiastic about the lesson and were eager to participate in the discussion." • Teacher appropriately re-directed unengaged or off-task students; *or* students displayed no off-task behavior."
Use of SIF Materials/Incentives	• "More than once, the teacher enthusiastically reminded students they are receiving specialized information about investing and that this is unusual for many middle school students." • "Teacher reminded students about their personal portfolio and engaged in a discussion about it." • (checklist) "Students completed the Weekly Attendance Exercise." • (checklist) "Students completed the Flash Review activity before the new lesson." • (checklist) "Teacher provided the answers to students' Flash Review exercise." • (checklist) "Teacher reminded students they earn SIF dollars by achieving good grades and attendance." • (checklist) "Teacher emphasized the importance of staying in school/completing a high school diploma."