Credit and Debt Outcomes for Participants in Compass FSS Programs

A Benchmarked Comparison

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Acknowledgments

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1.   Overview

This report describes the changes in credit score and debt since program enrollment for participants in Family Self-Sufficiency (FSS) programs administered by Compass Working Capital (Compass) in partnership with two Massachusetts public housing agencies (PHAs) and a nonprofit owner of multifamily rental housing properties. Compass is a national nonprofit financial services organization, headquartered in Boston and Philadelphia, that works with public housing agencies and private owners to administer FSS programs for households participating in U.S. Department of Housing and Urban Development (HUD) rental assistance programs. The two PHAs with participants in this analysis are Cambridge Housing Authority (CHA) and Metro Housing|Boston (Metro Housing), an affiliate of the Massachusetts Department of Housing and Community Development. The multifamily rental housing owner is Preservation of Affordable Housing (POAH).

This study's objective is to understand and contextualize the changes over time in FICO® Scores and debt levels of participants in the Compass FSS programs. To do this, the study employs a benchmarked comparison analysis that compares the average changes in FICO® Scores and debt levels for Compass FSS participants to those of a set of individuals with similar characteristics in the same geographic areas.

Our analysis finds that Compass FSS participants outperformed the comparison group (a set of people with similar characteristics who did not participate in the FSS program) on certain key indicators: Their FICO® Scores increased significantly, while the comparison group's scores stayed flat, and their total debt and student debt grew by less than the comparison group.

We also observe that Compass FSS participants without a FICO® Score at the beginning of the study period ("baseline") were less likely to have acquired one by the last observation point in the study period ("endline") than were their counterparts in the comparison group. (However, the Compass FSS participants who did acquire a credit score had higher credit scores on average than their comparison group counterparts did.) This lower likelihood of gaining a FICO® Score appears to be driven by a sub-sample of FSS participants in POAH multifamily housing, who had lower average incomes than the Compass FSS participants in the two FSS programs in PHAs. The POAH sub-sample also had significant reductions in credit card debt compared to their comparison group members.

Summary of Key Findings for FSS Participants versus the Comparison Group

Compared to the experiences of the comparison group, Compass FSS participants experienced the following between baseline and endline:

- Their FICO® Scores increased by **19.8** points **more**.

- Their total debt grew by **$3,210 less**.

- Their student debt grew by **$2,057 less**.

- For FSS participants living in POAH multifamily housing, their credit card debt grew by **$685 less** than the comparison group (the difference in credit card debt change was not statistically significant for the full sample).

- The share with no FICO® Score at baseline who gained one by endline was **11 percentage points lower** (a marginally statistically significant difference, apparently driven by the smaller, POAH sub-sample).

- The share with a prime FICO® Score (660 or above) increased by **7 percentage points more**, though the difference between the two groups was not statistically significant.

NOTES: This summary provides results of a difference-in-difference analysis for the primary analysis period, which concluded in March 2020, close to the beginning of the COVID-19 pandemic. "Total debt" excludes mortgage debt.

The above findings reflect the study's primary analysis, which is based on the period from May 2016 through March 31, 2020. The March 2020 end date was selected to minimize the impact of the COVID-19 pandemic on study outcomes.

The study also reports on an additional, exploratory analysis extending through March 2021 (available in **Appendix A**). This exploratory analysis finds similar results as the primary pre-pandemic analysis, but with stronger outcomes and larger differences between Compass and comparison group member experiences. While these results are exploratory, they are consistent with the possibility that participants in the Compass FSS program experience larger gains over time.

This study is a follow-up to a 2017 Abt Associates' (Abt) study examining the credit and debt outcomes for a different but overlapping set of Compass FSS partnerships (using Experian credit bureau data). That earlier study found that the Compass FSS participants outperformed benchmarked comparisons on several key outcomes, including FICO® Score, credit card debt, and delinquent debt (Geyer et al. 2017). Abt has also previously evaluated the impact of Compass FSS programs on earned income and the receipt of public benefits. Using a quasi-experimental design, that analysis found that households participating in three FSS programs that Compass administered in partnership with three public housing agencies had annual earned income that was $6,032 (23 percent) higher, on average, than the comparison group's (Moulton et al. 2021). In a cost-benefit analysis, we estimated that the program's benefits were more than twice its costs (Dastrup et al. 2021). The cost-benefit analysis considered impacts on earned income and public benefits only and did not factor in any impacts on credit scores or debt levels.

The findings of the current study are largely consistent with the 2017 credit and debt study's findings, even though we are using a different source of credit and debt data and a different set of housing agency partnerships and including, for the first time, a partnership with a multifamily housing provider.

2.   Summary of Methodology

This study analyzed credit and debt outcomes for people who enrolled in Compass FSS programs between May 1, 2016, and March 31, 2019. The *primary analysis* tracks outcomes through March 31, 2020—around the start of the COVID-19 pandemic; an additional *exploratory analysis* extends through March 31, 2021. To facilitate Abt's analysis of the credit and debt outcomes of Compass FSS participants, Compass provided de-identified semi-annual FICO® Score and debt data from TransUnion credit reports that it had collected from FSS participants as part of providing them with financial coaching.[1]

In the primary analysis, for each outcome, we calculated the average change from baseline to the latest data available through March 31, 2020. For Compass FSS participants, we used as the baseline data from the earliest credit report available between 60 days before FSS enrollment and six months after.

Though a change seen in outcomes could be due to participants' participation in the Compass FSS program, it is also possible the outcomes changed for unrelated reasons (e.g., shifts the economy, new policy, or overall trends in credit scores and borrowing over time). To account for that possibility, we benchmark the changes we observe for FSS participants against a "counterfactual"—representing how credit and debt levels might have changed over time in the absence of the Compass FSS program. To provide the counterfactual, we asked TransUnion credit bureau to identify and provide credit and debt data for a comparison set of people with similar characteristics in the same geographic areas over the same time period.

We report on the extent to which the changes in outcomes over time for Compass FSS participants differed from any change in those outcomes for this comparison group—a statistic known as "difference-in-differences."

2.1   Comparison Data and Baseline Periods (Cohorts)

TransUnion credit bureau provided annual credit report data for the comparison group from October 2016 through October 2020. To help us match the continuous enrollment over time of Compass FSS participants, TransUnion identified and provided baseline data for new cohorts of comparison group members as of three separate dates: October 2016, October 2017, and October 2018. TransUnion then provided data on the members of all three cohorts annually through October 2020.

As shown in **Exhibit 1**, we match each of these cohorts to Compass FSS participants whose baseline data was collected (at program enrollment) in the one-year period from six months before to six months after we received baseline data from TransUnion for each comparison group cohort. **Exhibit 1** also shows the endlines for the primary analysis period.

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[1]   According to www.myfico.com, "You can think of a FICO Score as a summary of your credit report. It measures how long you've had credit, how much credit you have, how much of your available credit is being used and if you've paid on time."

Exhibit 1. Compass and Comparison Group Study Cohorts and Observations (Primary Analysis)
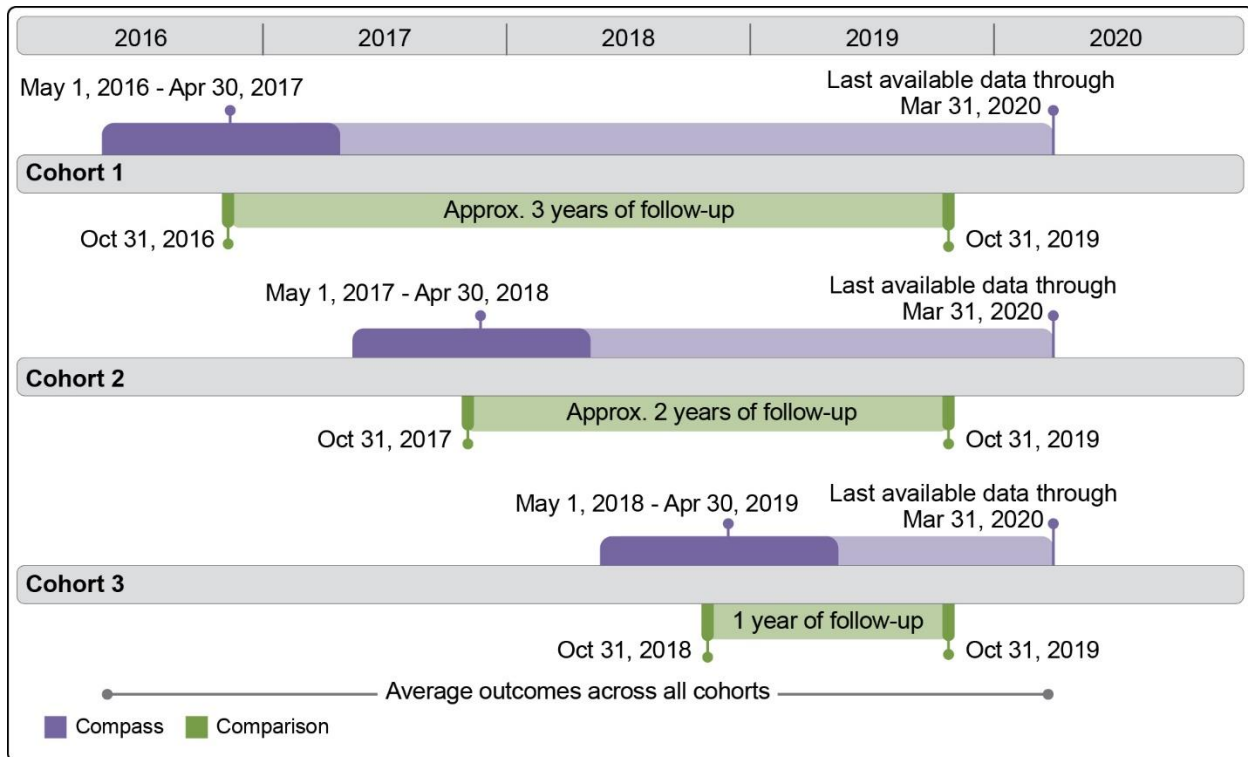
2.2 Matching and Weighting Samples

Because the data we obtained from TransUnion was not a direct match for the FSS participants in our sample, and some key factors (e.g., incomes below $18,000) were not identifiable, we needed to further match and weight the comparison data. We created separate matched comparisons based on each outcome of interest (e.g., FICO® Score, credit card debt, etc.) and the FSS participant's age at baseline, their cohort, and whether they were in POAH. We matched each Compass FSS participant to a minimum of three members from the TransUnion comparison group.

Each matched comparison group member is associated with a weight based on the number of times they were used as a comparison for a Compass FSS participant. We use these weights in our regression analyses to adjust the raw difference-in-differences statistics to account for any differences in the outcome of interest at baseline between Compass FSS participants and the comparison group. We only matched Compass FSS participants to comparison group members in the same cohort (see **Exhibit 1**).

2.3 Types of Analyses and Statistical Testing

To understand Compass FSS participants' outcomes and put them into context, we conducted three main types of analyses:

1. *Change in Compass Outcomes*—average differences between Compass FSS participant outcome characteristics at endline versus baseline.

2. *Difference-in-Differences*—difference on each outcome between Compass FSS participants' changes over time versus the matched comparison group's changes over time.

3. *Regression-Adjusted Difference-in-Differences*—difference on each outcome between Compass FSS participants' changes over time versus the matched comparison group's changes over time, adjusted for baseline differences in the outcome of interest to account for any remaining baseline differences.

For each set of analyses, we conducted tests for statistical significance of the difference between baseline and endline (for change in outcomes analyses) or difference between Compass and comparison groups (for difference-in-differences analyses).[2] We characterize our findings using a *p*-value, which provides the likelihood of observing that result when the difference does not really exist. For instance, if we observe a difference between Compass FSS participants and the comparison group of 5 points and a *p*-value of .04, we would say that there is a 4 percent chance that we would observe a difference of 5 points due to random chance when no difference existed in reality.

We characterize statistical tests where *p*-values are less than .10 as "marginally statistically significant"; less than .05 as "statistically significant"; and less than .01 as "highly statistically significant." In tables, these levels of significance are denoted by number of stars: *, **, and ***, respectively.

2.4   Limitations of this Analysis

After matching and weighting, key variations between the Compass FSS participants and comparison groups could still remain (e.g., variations in average estimated incomes, discussed below). Further, there are key characteristics that are not available for comparison group members (e.g., marital status, educational attainment, presence of children in the home, and housing assistance program participation). For this reason, we consider this to be a comparison analysis using a benchmark, rather than a quasi-experimental evaluation. In other words, though the differences in differences between Compass FSS participant outcomes and comparison group member outcomes are an important context for Compass FSS participant experiences, we cannot necessarily conclude that a statistically significant difference is due to the FSS program alone.

2.5   Compass PHA and POAH Comparison Groups and Sub-Groups

We report on results for three groups of Compass FSS participants (and related comparison group members):

- *Analysis on the Full FSS Sample*—includes the full sample of Compass FSS participants, including the sub-groups constructed for the two analyses described below. The comparison group for this analysis is the sum of the comparison groups selected for the Compass FSS sub-group analyses.

- *Analysis on the PHA Only Sample*—includes Compass FSS participants who received rental assistance through either CHA or Metro Housing (which administers vouchers in the Boston metropolitan area). The associated TransUnion comparison group is drawn from the same ZIP codes of the participants in the PHA sample and weighted to reflect the same time spans observed for the PHA sample.[3] For example, if 30 percent of the PHA sample enrolled in one particular study cohort, 30 percent of the comparison group members would come from the same study cohort.

- *Analysis on the POAH Only Sample*—includes Compass FSS participants who received project-based rental assistance in multifamily developments owned by POAH in Massachusetts, Rhode

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[2]   For each statistical test, we use heteroscedastic robust standard errors.

[3]   Comparison group ZIP codes for the sub-sample and full sample analyses were not weighted by popularity of individual ZIP codes among Compass FSS participants but were instead treated as a pool of ZIP codes from which the sample was drawn. While further weighting would have been optimal, it was not possible because of limitations on the scope of our consumer sampling and data availability within the data ranges we requested (see Appendix B for more information on how the base comparison samples were drawn).

Island, and Connecticut. The associated TransUnion comparison group is drawn from the same ZIP codes and weighted to the same cohorts as observed for the POAH sample.

2.6 Time Period

This project started shortly after the COVID-19 pandemic began. Because of the substantial influence of the economic disruption associated with the pandemic, we were concerned that an evaluation that extended far into the pandemic period would measure FSS participant and comparison group member adaptation to the pandemic rather than experiences independent of this substantial global health and economic crisis.

Primary Analysis. To address this, the time period for the primary analysis for each member of the Compass sample ends at the last observation to occur that is at least one year after the baseline observation and falls before April 1, 2020. In this analysis, the endline for each member in the comparison group is October 2019, the last annual data point before spring 2020.

Secondary Analysis. As an additional, exploratory analysis, we observed outcomes over a time period that began on the same baseline as the primary analysis but extended past the onset of the COVID-19 pandemic. This analysis includes data collected both before and after the pandemic began. For each FSS participant, this includes the latest observation before April 1, 2021. The endline for each member in the comparison group is October 2020.

A detailed explanation of our methodology is provided in **Appendix B**.

3. Compass FSS Baseline Characteristics

Exhibit 2 shows the baseline characteristics of the Full FSS sample, as well as the PHA Only and POAH Only samples. Additional detail of the distribution of credit score and debt characteristic for Compass FSS participants at baseline is provided in Appendix A, **Exhibit A-3**.

Exhibit 2. **Compass FSS Participants: Average Credit, Debt, and Earnings Characteristics at Baseline, by Sample**

	Full FSS Sample	PHA Only Sample	POAH Only Sample
Women	88%	90%	86%
Age (years)	39.9	42.2	36.2
FICO® Score	611	621	588
No FICO® Score	21%	12%	36%
Estimated annual income	$18,719	$24,451	$9,565
Total debt	$18,190	$22,638	$10,631
Collection debt	$2,088	$2,326	$1,684
Credit card debt	$2,126	$2,603	$1,314
Student debt	$11,370	$14,328	$6,343
Auto debt	$3,714	$4,699	$2,041
Credit utilization	45.2%	46.6%	40.8%
Black	42%	53%	24%
Latinx/Hispanic	30%	26%	37%
White	23%	13%	41%
Asian or Pacific Islander	1%	1%	1%
American Indian	3%	3%	2%
Other	6%	7%	5%
Missing or Did not Provide	7%	8%	5%
# of Participants	**359**	**226**	**133**

SOURCE: Compass Working Capital administrative data, May 1, 2016–March 31,2020.
NOTE: The number of people represented by the percentages in each cell vary somewhat for cases where debt and FICO® Score information are missing. Of the 359 Compass FSS participants observed at baseline, 283 had a FICO® Score and 359 had any debt record (42 of those with debt records had zero debt at baseline). Additionally, in order to prevent debt averages skewed by outliers, we excluded from all debt analysis (but not the analysis of FICO® Scores) any households that held mortgage debt during the analysis period. This included 1 member (0.3 percent) of the Compass sample and 72 members (2.4 percent) of the comparison group sample. No member in either sample had any mortgage debt at baseline. Compass participants could select more than one category for race or ethnicity and were counted as all categories they selected (leading to a total of over 100 percent across all race and ethnicity categories).

As described in **Appendix B**, we have constructed a separate matched comparison sub-sample to provide benchmarks for each outcome; doing so ensures a better fit between the Compass and comparison samples at baseline. Baseline characteristics of comparison group members used for each analysis are provided in **Exhibit 3**, in the next section of the report, together with the outcomes and results for all sample members in the analysis.

4.   Changes in FICO® Score and Debt Outcomes

Exhibit 3 below shows how, during the pre-pandemic period, selected credit and debt outcomes changed over time for Compass FSS participants and the comparison group and compares the changes for each group. *Overall, our analysis finds that Compass FSS participants experienced a number of more favorable credit and debt outcomes than the comparison group.*

The first four columns of **Exhibit 3** show the number of members in each FSS sample, average outcomes at baseline, average outcomes at endline (or latest observation), and changes in average values from endline to baseline, for Compass FSS participants. The next four columns show the same information, for the comparison group. The second to last column ("Unadjusted Difference-in-Differences") shows the raw *differences* between changes over time for the Compass FSS participants and changes over time for the benchmark comparison group.

The final column adjusts the raw differences to reflect differences in baseline values between the FSS participants and the comparison group members ("Regression-Adjusted Difference-in-Differences"). We consider the regression-adjusted difference-in-differences analysis to be the most statistically robust comparison of the debt and credit experiences of the two groups; it is the finding we refer to throughout the rest of this report, unless specified otherwise. For each comparison, we provide results of tests of statistical significance using heteroscedastic standard errors, marked by *, **, and ***.

4.1   Full FSS Sample

Changes in FICO® Score

Compass FSS participants increased their FICO® Scores by 16.9 points on average since enrolling in the FSS program, which was marginally statistically significant ($p<.10$). However, comparison group members saw essentially no change in credit score between baseline and endline (a 0.8-point increase) and this change was not statistically significant. After adjusting for variations in baseline values between the Compass and comparison groups, we found that Compass FSS participants **increased their FICO® Scores by almost 20 points**, a large and highly statistically significant difference in differences ($p<.01$).

Changes in Debt

- *Total Debt:* Compass FSS participants increased their total debt during this period by $5,098—an increase of 28 percent that was statistically significant ($p<.05$). However, this increase was significantly smaller than the $8,319 increase by comparison group members. After adjusting for variations in baseline values relative to the comparison group, we found Compass FSS participants **increased their total debt by $3,210 less** than the comparison group did ($p<.05$).

- *Student Debt:* The analysis also found that Compass FSS participants outperformed the benchmarked comparison group on student debt. After adjusting for variations in baseline values, we found Compass FSS participants **increased their student debt by $2,057 less** than the comparison group did (highly statistically significant, $p<.01$).

- *Other Debt:* At the same time, relative to the comparison group, after adjusting for variations in baseline values, we found Compass FSS participants **increased their auto loan debt by $927 more** than the comparison group (marginally statistically significant, $p<.10$). Adjusted difference-in-differences for collection debt and credit card debt were not statistically significant. Because credit utilization fell among the comparison group but stayed essentially the same among Compass FSS participants, after adjusting for variations in baseline values, we found that the **credit utilization rate was 5.2 percentage points higher for Compass** (marginally statistically significant, $p<.10$).

Exhibit 3. **Compass FSS Participants versus Comparison Group: Average Change in Comparable Debt Statistics between Baseline and Endline**

	Compass				Comparison Group				Unadjusted Difference in Differences	Regression-Adjusted Difference in Differences
	Unique *N*	Baseline	Endline	Change	Unique *N*	Baseline	Endline	Change		
Combined Samples										
FICO® Score	282	612	629	16.9**	654	610	610	0.8	16.1*	19.8***
Total debt	358	$18,216	$23,313	$5,098**	854	$17,576	$25,895	$8,319***	-$3,221	-$3,210**
Collection debt	358	$2,091	$2,407	$317	1,548	$1,251	$1,064	-$187	$504	$504
Credit card debt	358	$2,128	$3,114	$986***	1,174	$1,967	$3,040	$1,073***	-$87	-$87
Student debt	358	$11,402	$13,812	$2,410	1,743	$10,614	$15,081	$4,467***	-$2,057	-$2,057***
Auto debt	358	$3,711	$5,272	$1,561***	1,964	$3,612	$4,225	$613	$948	$927*
Credit utilization	209	45%	45%	0.2 pp	758	44%	39%	-4.4 pp*	4.7 pp	5.2 pp*
PHA Samples										
FICO® Score	197	622	642	20.0**	453	621	618	-2.6	22.6**	25.3***
Total debt	225	$22,699	$28,982	$6,283**	550	$22,300	$32,274	$9,973***	-$3,691	-$3,691*
Collection debt	225	$2,331	$2,582	$250	1,118	$1,144	$939	-$205	$455	$455
Credit card debt	225	$2,608	$3,813	$1,205**	794	$2,391	$3,327	$936**	$269	$269
Student debt	225	$14,392	$17,658	$3,266	1,187	$14,027	$19,577	$5,550**	-$2,283	-$2,283**
Auto debt	225	$4,698	$6,354	$1,656**	1,374	$4,478	$4,667	$189	$1,468	$1,445**
Credit utilization	158	46%	47%	0.9 pp	575	45%	41%	-4.3 pp	5.2 pp	5.7 pp
POAH Samples										
FICO® Score	85	588	597	9.2	209	586	593	7.0	2.3	6.6
Total debt	133	$10,631	$13,725	$3,094	317	$9,756	$15,215	$5,459***	-$2,365	-$2,376*
Collection debt	133	$1,684	$2,113	$429	448	$1,403	$1,249	-$154	$582	$582
Credit card debt	133	$1,314	$1,930	$616	391	$1,187	$2,488	$1,301***	-$685	-$685**
Student debt	133	$6,343	$7,305	$962	575	$5,233	$8,012	$2,779*	-$1,817	-$1,817*
Auto debt	133	$2,041	$3,442	$1,401*	609	$1,993	$3,344	$1,351***	$49	$31
Credit utilization	51	41%	39%	-1.8 pp	186	39%	34%	-4.5 pp	2.7 pp	3.6 pp

SOURCE: Compass Working Capital administrative data, May 1, 2016–March 31, 2020. TransUnion credit bureau comparison sample credit report data, annually October 31, 2016–October 31, 2019.

NOTE: "Total debt" category excludes mortgage debt. Adjusted difference-in-differences estimates are regression-adjusted for baseline characteristics.

*/**/*** indicates statistically different from baseline or statistically different changes from baseline at the 10, 5, and 1 percent levels, respectively.

4.2 Sub-sample Analyses

Looking just at the sub-samples of FSS participants (PHA Only Sample, POAH Only Sample) in **Exhibit 3** (presented side by side in **Exhibit 3A**), we found the following:

- FICO® *Score*: The results for the PHA only sample are similar to the results for the full FSS sample on FICO® Score, with PHA participants on average increasing their scores more than their comparison group counterparts did by 25 points (highly statistically significant, $p<.01$). Among the smaller group of FSS participants in the POAH sample, we found no significant difference in differences in FICO® Scores.

- *Total Debt*: FSS participants in the PHA and POAH samples both increased their total debt less than their comparison groups, though the differences between these samples and their respective comparison groups were only marginally significant ($p<.10$). The adjusted difference in differences for the FSS participants in PHAs was $3,691 less than their comparison group, and for the FSS participants in POAH, it was $2,376 less than their comparison group.

Exhibit 3A. Adjusted Difference-in-Differences for Each Sample Group, Compared to their Comparison Groups

	Regression-Adjusted Difference in Differences		
	Combined Samples	**PHA Samples**	**POAH Samples**
FICO® Score	19.8***	25.3***	6.6
Total debt	-$3,210**	-$3,691*	-$2,376*
Collection debt	$504	$455	$582
Credit card debt	-$87	$269	-$685**
Student debt	-$2,057***	-$2,283**	-$1,817*
Auto debt	$927*	$1,445**	$31
Credit utilization	5.2 pp*	5.7 pp	3.6 pp

*/**/*** indicates statistically different changes from baseline compared to their comparison groups at the 10, 5, and 1 percent levels, respectively.

- *Collection Debt:* As in the full sample, the PHA and POAH only sample members did not significantly increase or decrease their collection debt compared to their corresponding comparison group members.

- *Credit Card Debt:* FSS participants in the PHA sample did not significantly increase or decrease their credit card debt compared to their comparison group. FSS participants in POAH increased their credit card debt $685 less than their comparison group did, a statistically significant difference ($p<.05$).

- *Student Debt*: The results for the PHA only sample are similar to the results for the full sample of FSS participants, with PHA participants increasing their student debt less than their comparison group counterparts did by $2,283 ($p<.05$). Among the POAH sample, their student debt increased by $1,817 less than their comparison group did, a marginally significant difference ($p<.10$).

- *Auto Debt:* FSS participants in the PHA sample increased their auto loan debt by $1,445 more than their comparison group did ($p<.05$). The POAH group saw no significant difference compared to their comparison group.

We cannot say for sure why the results differ somewhat between the two subgroups of Compass FSS participants. Follow-up times and duration in FSS are similar for the PHA and POAH groups (2.7 years and 2.5 years respectively). The relatively small sample size of the POAH group, differences in participant characteristics and needs at baseline (notably, lower incomes in the POAH group), differences in specific living locations and housing, or differences in program delivery all might contribute to the variation in outcomes between the PHA and POAH subgroups. More generally, the POAH participants' lower incomes may lead to a worse comparison group match because the income estimator available for the comparison group does not include estimated incomes below $18,000 per year.

4.3 Differences by Cohort

As reflected in **Exhibit 1**, we assigned Compass FSS participants to cohorts based on the dates of their enrollment, with each cohort corresponding to one year of continuous enrollment.

Appendix A, **Exhibit A-2** shows the results of analysis by cohort. Generally, we found that longer participation in FSS was associated with larger improvements in FICO® Scores, both within the Compass FSS sample and compared to the comparison group members in the same cohort. For example, FSS participants in Cohort 1 (three years of participation) increased their FICO® Scores nearly 30 points more than the comparison group did (not adjusted; statistically significant, $p<.01$) whereas Cohort 3 (one year of participation) increased their scores by only 7.5 points more than the comparison group (not statistically significant). Similar patterns emerged with debt (though Compass FSS Cohort 3 participants had a more negative difference from their comparison group than Cohort 2 did). Most of these difference in differences were not statistically significant.

The results are consistent with the possibility that longer exposure to Compass FSS leads to larger improvements. However, Compass stopped collecting data on its participants after they left the program, so the results could also be due to attrition as less successful participants leave the program or a combination of multiple factors.

4.4 Differences in Presence or Absence of Debt by Category

In Appendix A, **Exhibit A-7**, we examine the percentage of Compass FSS and comparison group participants with any debt by category from baseline to endline.

The share of Compass FSS participants with any credit card debt increased by about 13 percentage points, about six percentage points more than the increase among the Comparison group, although this difference was not statistically significant. The share of Compass FSS participants with any collection debt fell by five percentage points, whereas the Comparison group's share fell by one percentage point, resulting in a decrease in the Compass share with collection debt of 4 percentage points, relative to the comparison group (also not statistically significant).

Note that the presence of any credit card debt is an ambiguous indicator, as it may indicate that participants have gained access to credit they did not previously have or may support individuals in building a credit file.

5. Gaining a FICO® Score and Exceeding a Threshold for Prime Credit

This section focuses on the extent to which Compass FSS participants gained a FICO® Score or exceeded a threshold for prime credit between baseline and endline. FICO® Scores can vary in multiple meaningful ways. A person can have a high or a low score, which has an effect on the credit and interest rates available to them. A person can have no FICO® Score calculated at all, because of a thin credit file (e.g., no recent borrowing history, or very recent little borrowing history), which limits their access to credit substantially. Twenty-one percent of Compass FSS participants and 18 percent of benchmark comparison group members had no FICO® Score at baseline.

In this section, we first describe the extent to which Compass FSS participants and comparison group members without FICO® Scores gained them, and if so, at what level. We then examine the extent to which Compass FSS participants and comparison group members achieved a prime FICO® Score.

5.1 Score Attainment

Exhibit 4 shows the share of Compass FSS and comparison group members who had no FICO® Score at baseline but who had attained one by endline and their average scores at endline. Overall, comparison group members without a FICO® Score at baseline were more likely to attain one by endline than were Compass FSS participants, a result that is marginally significant ($p<.10$). The results varied by sub-sample of Compass FSS participants. PHA only sample members were more likely than their comparison group members to have a score at endline (though the difference is not statistically significant). POAH only sample members were significantly less likely than their comparison group members to have a score at endline ($p<.05$).

Exhibit 4.   Experiences of Study Members (Full Sample) without FICO® Scores at Baseline

	Combined Samples		PHA Samples		POAH Samples	
	Compass Combined	Comparison Combined	Compass PHA	Comparison PHA	Compass POAH	Comparison POAH
No FICO® Score at baseline but had one at endline[a]	51%	62%*	71%	64%	40%	60%**
Average endline FICO® Score of those who gained a FICO® Score	607.5	588.4	603.6	593.8	611.6	577.8
Number with no FICO® score at baseline	76	594	28	396	48	201
Average years since baseline	2.6	2.0	2.7	2.0	2.5	2.0

SOURCE: Compass Working Capital administrative data, May 1, 2016–March 31,2020. TransUnion credit bureau comparison sample credit report data, annually October 31, 2016–October 31, 2019.
[a] Twenty-one percent of Compass FSS participants were missing a FICO® Score at baseline. In the comparison group, 20 percent of participants were missing a FICO® Score at baseline.
*/**/*** indicates statistically different between Compass FSS and comparison group changes from baseline at the 10, 5, and 1 percent levels, respectively.

5.2 Average Score

For the combined samples and both Compass sub-samples, the average scores at endline for Compass FSS participants who previously had not had scores were higher than those of their comparison group members, though these differences were not statistically significant.

We also examined the extent to which Compass FSS participants and comparison group members were able to achieve scores that are high enough to access certain types of credit products. Though there is some variation in how lenders use credit scores to assess risk, a FICO® Score of 660 is often used as a cutoff for prime credit.[4] Some mortgage programs (e.g., Massachusetts Boston Housing Partnership's ONE Mortgage program) have required potential borrowers to have a score of 660 or above to be approved for a loan.

Exhibit 5 explores the extent to which Compass FSS participants and comparison group members achieve, lose, gain, or maintain a prime FICO® Score of 660 or above. On the whole, the comparison group was similar to the full FSS sample at baseline, where 24 percent of each had a prime credit score (i.e., at or above 660). However, by endline, 37 percent of Compass FSS participants had achieved a prime credit score, as compared to only 30 percent of comparison group members, a 7 percentage point difference that is marginally statistically significant (p<.10). A substantial share of Compass FSS participants attained a prime FICO® Score between baseline and endline (15 percent of participants), and only a few (three percent) lost a prime credit score. Approximately 80 percent of the Compass FSS participants who had a FICO® Score of 660 or above at baseline maintained a score at that level at endline. Comparison group members had nearly the same level of maintenance of a FICO® Score of 660 or above, but fewer gained a prime FICO® Score between baseline and endline (11 percent compared to 15 percent of the Compass sample, not statistically significant) and more lost their prime scores.

Exhibit 5.   **Compass FSS Participants and Comparison Group: Percentage Who Gain, Lose, and Maintain a "Threshold" FICO® Score between Baseline and Endline (Full Sample)**

	Compass Participants (*N*=282)	Comparison Group (*N*=654)	Difference between Compass and Comparison Group
660 or above at baseline	24%	24%	0 pp
660 or above at endline	37%	30%	7 pp*
660 or above at both baseline and endline	21%	19%	2 pp
Attained a FICO® Score of 660 or above between baseline and endline[a]	15%	11%	4 pp
Lost a FICO® Score of 660 or above between baseline and endline[b]	3%	5%	-2 pp
Average years since baseline	2.2	2.1	0.1

SOURCE: Compass Working Capital administrative data, May 1, 2016–March 31,2020. TransUnion credit bureau comparison sample credit report data, annually October 31, 2016–October 31, 2019.

[a] Includes increasing score to ≥660 or moving from no score to a score of ≥660.

[b] Includes decreasing score to <660 or moving from a score of ≥660 to no score.

*/**/*** indicates statistically different between Compass FSS and comparison samples at the 10, 5, and 1 percent levels, respectively.

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[4]   For example, the Federal Deposit Insurance Corporation includes a FICO® Score of 660 or below as one trigger for defining a borrower as subprime; see
https://www.fdic.gov/regulations/examinations/credit_card/pdf_version/ch8.pdf.

6.   Extended Period Exploratory Findings

The primary study period focuses on the time before the global COVID-19 pandemic, but we have also conducted an exploratory analysis continuing approximately one year into the pandemic. Outcomes that include data following the start of the pandemic could be difficult to interpret, as this period included sudden increases in unemployment, together with loan forbearance and stimulus payments. At the same time, extending the period allows us to include more sample members in the analysis and longer exposure to the Compass FSS program.

As reflected in Appendix A, **Exhibit A-1**, by the end of the extended period, Compass FSS participants had an overall average increase in FICO® Score relative to their baseline values of 33 percentage points (compared to their almost 17-point increase during the primary study period). Comparison group members had an average increase in FICO® Score during the extended period of 11 points (compared to essentially no change during the primary study period). After adjusting for variations in baseline values relative to the comparison group, we found Compass FSS participants experienced a highly statistically significant difference in differences in their scores (p<.01) during the extended period of 23 percentage points. As in the primary analysis, Compass FSS participants significantly reduced their total debt and student debt and significantly increased their auto debt relative to the comparison group.

The reductions in debt relative to the comparison group seen in the combined sample is largely mirrored in the PHA and POAH sub-samples. As **Exhibit A-1** shows, however, nearly all of the gain in average credit score in the extended period was concentrated among the PHA sample; the POAH sample had essentially the same change over time in FICO® Score as did the comparison group. One potential explanation for this difference in experiences between the FSS sub-samples is the lower incomes of participants in the POAH sample; it is possible they were more adversely affected by the pandemic than were participants individuals in the PHA sample. At the same time, the POAH sub-sample experienced a statistically significant reduction in credit card debt relative to the comparison group. This could potentially reflect an impact of the Compass financial coaching; alternatively, it could be related to the lower incomes of the POAH sub-group, which could have made them less able to support higher credit card debt.

7.   Conclusions

Like our first analysis of credit and debt outcomes for Compass FSS participants (Geyer et al. 2017), this new analysis finds generally strong credit and debt outcomes for Compass FSS participants. Compass FSS participants experienced marked increases in FICO® Score and smaller increases in debt compared to the benchmarked comparison analysis group. Smaller increases in total debt and student debt were seen in both the PHA and POAH sub-groups. The PHA sub-group experienced larger increases in FICO® Scores than the POAH sub-group. The POAH sub-group experienced improvements in credit card debt not seen in the PHA sub-group.

Our findings on credit and debt improvements among Compass FSS participants complement our previous findings that participation in Compass FSS was associated with substantial increases in earned income and reductions in cash public assistance benefits (Geyer et al. 2017, Moulton et al. 2021, Yang et al. 2021), producing benefits that outweigh the costs (Dastrup et al. 2017, Dastrup et al. 2021). Together, these analyses show that participation in Compass FSS programs leads to substantial financial benefits for program participants.

Appendix A: Extended Analyses and Subgroups

A.1   Extended Endline Outcomes

The study focuses on the pre-pandemic period, but we conducted an additional, exploratory, analysis extending into the post-pandemic period. **Exhibit A-1** shows the average changes in FICO® Score and debt by category for Compass FSS participants and matched comparison group members through March 31, 2021, for Compass FSS participants and October 2020 for comparison group members.

Exhibit A-1. Compass FSS Participants versus Comparison Group: Average Change in Comparable Debt Statistics between Baseline and Extended Endline (through March 31, 2021)

	Compass				Comparison Group				Un-adjusted Difference in Differences	Regression-Adjusted Difference in Differences
	Unique *N*	Baseline	Endline	Change	Unique *N*	Baseline	Endline	Change		
Combined Samples										
FICO® Score	283	612	645	33.1***	657	610	621	11.0**	22.1**	22.8***
Total debt	359	$18,202	$23,508	$5,306**	858	$17,565	$26,626	$9,061***	-$3,755	-$3,744***
Collection debt	359	$2,085	$1,547	-$538	1,556	$1,248	$973	-$275**	-$263	-$263
Credit card debt	359	$2,126	$2,735	$609*	1,173	$1,967	$2,693	$727***	-$117	-$117
Student debt	359	$11,370	$14,109	$2,739	1,752	$10,585	$15,835	$5,250***	-$2,511	-$2,511**
Auto debt	359	$3,734	$5,574	$1,840***	1,973	$3,634	$4,331	$697*	$1,143	$1,138**
Credit utilization	210	45%	36%	-9.4 pp**	761	44%	31%	-13.2 pp***	3.8 pp	4.2 pp
PHA Samples										
FICO® Score	198	622	657	35.5***	456	621	628	7.7	27.9***	29.7***
Total debt	226	$22,658	$28,733	$6,076*	554	$22,264	$32,117	$9,853***	-$3,778	-$3,778*
Collection debt	226	$2,321	$1,315	-$1,006	1,126	$1,139	$951	-$188	-$818	-$818
Credit card debt	226	$2,603	$3,314	$711	793	$2,388	$2,925	$537	$174	$174
Student debt	226	$14,328	$17,575	$3,247	1,196	$13,967	$20,319	$6,353***	-$3,106	-$3,106**
Auto debt	226	$4,730	$6,730	$2,000**	1,383	$4,510	$4,669	$160	$1,840*	$1,840**
Credit utilization	159	46%	37%	-9.0 pp**	578	45%	32%	-13.5 pp***	4.5 pp	5.0
POAH Samples										
FICO® Score	85	588	614	25.4*	209	586	604	17.6*	7.8	6.0
Total debt	133	$10,631	$14,628	$3,998	317	$9,756	$17,364	$7,608***	-$3,611	-$3,622***
Collection debt	133	$1,684	$1,940	$256	448	$1,403	$984	-$419**	$675	$675**
Credit card debt	133	$1,314	$1,751	$437	391	$1,187	$2,238	$1,051***	-$614	-$614**
Student debt	133	$6,343	$8,219	$1,877	575	$5,233	$8,657	$3,424**	-$1,547	-$1,547*
Auto debt	133	$2,041	$3,611	$1,569**	609	$1,993	$3,628	$1,634***	-$65	-$82
Credit utilization	51	41%	30%	-10.8 pp	186	39%	27%	-12.1 pp**	1.3 pp	1.4 pp

SOURCE: Compass Working Capital administrative data, May 1, 2016–March 31, 2021. TransUnion credit bureau comparison sample credit report data, annually October 31, 2016–October 31, 2020. NOTE: "Total debt" category excludes mortgage debt. Adjusted difference-in-differences estimates are regression-adjusted for baseline characteristics.
*/**/*** indicates statistically different from baseline or statistically different changes from baseline at the 10, 5, and 1 percent levels, respectively.

A.2   Changes by Baseline Cohort

As described in Appendix B, in comparing Compass FSS participants to the comparison group, we constructed cohorts within the continuous Compass FSS enrollment period to match the three comparison cohorts:

- Cohort 1 includes Compass FSS participants enrolling between May 1, 2016, and April 30, 2017.

- Cohort 2 includes Compass FSS participants enrolling between May 1, 2017, and April 30, 2018.

- Cohort 3 includes Compass FSS participants enrolling between May 1, 2018, and April 30, 2019.

Exhibit A-2 explores the changes in FICO® Score and debt between baseline and endline for Compass FSS participants and the comparison group by cohort.

After adjusting for variations in baseline values relative to the comparison group, Compass FSS participants in Cohorts 1 and 2 had large improvements in credit scores that were highly (for the Cohort 1) and marginally (for Cohort 2) statistically significant. While Compass FSS participants in the first two cohorts also had less growth in debt than did their comparison group, these differences were not statistically significant. As might be expected, changes in credit and debt were smaller for the 3rd Compass FSS cohort, which had less time since baseline and since FSS enrollment; however, that group experienced a highly statistically significant *reduction* in student debt and a highly statistically significant *increase* in auto debt relative to the comparison group.

The large changes seen among Compass FSS participants in the 1st and 2nd cohorts could be due to continued exposure to the Compass FSS program and are consistent with the conclusion that the program may help participants increase FICO® Scores and limit debt substantially, with accelerating benefits per year. At the same time, we lack data for Compass FSS participants after they leave the Compass FSS program, so the results could also be due to attrition as less successful participants leave the program. (Compass was not permitted to collect participant data after they exit the FSS program, regardless of their reason for exiting.)

Exhibit A-2.   Change in Credit Score and Debt from Baseline by Cohort (Full Sample)

	Compass			Comparison Group			Difference in Differences (not adjusted)		
	Cohort 1 (3 yrs)	Cohort 2 (2 yrs)	Cohort 3 (1 yr)	Cohort 1 (3 yrs)	Cohort 2 (2 yrs)	Cohort 3 (1 yr)	Cohort 1 (3 yrs)	Cohort 2 (2 yrs)	Cohort 3 (1 yr)
FICO® Score	28.2***	1.9	3.9	-2.1	-15.2***	-3.5	30.3***	17.1*	7.5
Total debt	$7,256***	$3,865***	$2,597*	$11,576 ***	$4,967***	$6,225***	-$4,317	-$1,102	-$3,628*
Collection debt	$321	$1,303	-$809	-$195	-$96	-$278	$516	$1,399*	-$531
Credit card debt	$1,591***	$568	$369	$1,622***	$1,006***	$160	-$31	-$438	$209
Student debt	$3,998***	$1,930***	$92	$5,286***	$3,525***	$4,058***	-$1,288	-$1,595	-$3,965***
Auto debt	$1,371*	$1,244*	$2,263***	$1,097***	$643	-$182	$274	$600	$2,446***
Credit utilization	-1 pp	-3 pp	8 pp*	-6 pp*	-5 pp	-0.4 pp	5.4 pp	2.6 pp	8.2 pp

SOURCE: Compass Working Capital administrative data, May 1, 2016–March 31,2020. TransUnion credit bureau comparison sample credit report data, annually October 31, 2016–October 31, 2019.
NOTES: The number of study members included in the analysis varies by year and outcome measured because of data availability and sample matching. Sample sizes ranged as follows, depending on outcome: Cohort 1: Compass FSS (174–328), comparison (507-1,434); Cohort 2: Compass FSS (123–206), comparison (379–1,236); Cohort 3: Compass FSS (112–182), comparison (367–1,160). On average, Cohort 1 has been in Compass for three years; Cohort 2 has been in Compass for two years; and Cohort 3 has been in Compass for one year. "Total debt" excludes mortgage debt.
*/**/*** indicates statistically different from baseline or statistically different changes from baseline at the 10, 5, and 1 percent levels, respectively.

A.3   Distribution of Compass and Comparison Group FICO® Scores and Debt at Baseline

In **Exhibit A-3**, we show the distribution of the Compass FSS participants' FICO® Scores and debt levels upon enrolling in Compass FSS.

Exhibit A-3. Compass FSS Participants – Debt and FICO® Score at Baseline (Full Sample)

	Min.	Percentile					Max.	Average
		5th	25th	50th	75th	95th		
FICO® Score	445	482	553	603	657	774	820	611.1
Total debt	$0	$0	$916	$7,599	$23,136	$78,371	$179,655	$18,190
Collection debt	$0	$0	$0	$234	$1,501	$8,284	$166,975	$2,088
Credit card debt	$0	$0	$0	$328	$2,163	$10,205	$42,516	$2,126
Student debt	$0	$0	$0	$0	$10,854	$57,107	$171,749	$11,370
Auto debt	$0	$0	$0	$0	$4,826	$21,554	$36,879	$3,714
Credit utilization	0%	0%	7%	40%	74%	111%	259%	45.2%

SOURCE: Compass Working Capital administrative data, May 1, 2016–March 31,2020. TransUnion credit bureau comparison sample credit report data, annually October 31, 2016–October 31, 2019.
NOTE: FICO® Score percentiles exclude those without a FICO® Score. "Total debt" excludes mortgage debt.

A.4   Distribution-level Changes in Debt and Credit Characteristics between Baseline and Pre-COVID Endline

Exhibits A-4 and **A-5** provide the percentile distribution of changes in debt from baseline to endline seen by the Compass FSS participants and comparison group members respectively. They also show the percentage of individuals in each group who reduced debt or maintained an absence of debt between baseline and endline. **Exhibit A-6** provides the percentile distribution of changes in FICO® Score from baseline to endline for Compass FSS and comparison group members, and the share who increased or gained a score between baseline and endline.

Exhibit A-4. *Compass FSS Participants* (Full Sample) – Changes in Debt Level between Baseline and Endline (Pre-COVID)

	Percentile					Average	Improved or Maintained No Debt
	5th	25th	50th	75th	95th		
Total debt	-$8,143	-$857	$615	$7,749	$30,769	$5,038	39%
Collection debt	-$4,090	-$337	$0	$114	$5,240	$328	73%
Credit card debt	-$2,112	$0	$64	$1,410	$7,752	$976	48%
Student debt	-$2,843	$0	$0	$1,145	$18,798	$2,404	66%
Auto debt	-$9,492	$0	$0	$0	$16,922	$1,510	77%
Credit utilization rate	-68 pp	-13 pp	0 pp	14 pp	73 pp	0.9 pp	n/a

SOURCE: Compass Working Capital administrative data, May 1 1, 2016–March 31,2020. TransUnion credit bureau comparison sample credit report data, annually October 31, 2016–October 31, 2019.
NOTE: "Total debt" excludes mortgage debt.

Exhibit A-5. *Comparison Group* Participants (Full Sample)– Changes in Debt Level between Baseline and Endline (Pre-COVID)

	Percentile					Average	Improved or Maintained No Debt
	5th	25th	50th	75th	95th		
Total debt	-$10,300	-$673	$904	$10,359	$42,309	$5,610	38%
Collection debt	-$3,188	-$218	$0	$2	$2,273	$129	75%
Credit card debt	-$2,218	$0	$0	$987	$7,432	$787	54%
Student debt	-$1,099	$0	$0	$1,934	$30,192	$3,169	65%
Auto debt	-$8,027	$0	$0	$0	$16,247	$1,090	84%
Credit utilization rate	-93 pp	-20 pp	0 pp	15 pp	75 pp	-2.5 pp	n/a

SOURCE: Compass Working Capital administrative data, May 1, 2016–March 31,2020. TransUnion credit bureau comparison sample credit report data, annually October 31, 2016–October, 2019.
NOTE: "Total debt" excludes mortgage debt.

Exhibit A-6. Compass FSS Participants versus Comparison Group (Full Sample): Changes in FICO® Scores between Baseline and Endline (pre-COVID)

	Percentile					Increased Score or Gained a Score
	5th	25th	50th	75th	95th	
Compass (N=283)	-91	-23	15	47	119	62%
Comparison Group (N=657)	-129	-44	1	37	90	48%

SOURCE: Compass Working Capital administrative data, May 1, 2016–March 31,2020. TransUnion credit bureau comparison sample credit report data, annually October 31, 2016–October 31, 2019.

A.5   Presence of Debt

Exhibit A-7 shows changes in the percentages of Compass FSS and TransUnion comparison group members with any debt by debt category between baseline and endline.

Exhibit A-7. Compass FSS Participants versus Comparison Group: Average Change in Comparable Debt Statistics between Baseline and pre-COVID Endline (Full Sample)

	Compass FSS Full Sample				Comparison Group Full Sample				Difference in Differences
	Baseline	Endline	Change	*p*-Value	Baseline	Endline	Change	*p*-Value	
With any debt	89%	93%	5 pp	0.03**	86%	88%	2 pp	0.25	3 pp
With any credit card debt	60%	73%	13 pp	0.00***	54%	62%	8 pp	0.00***	6 pp
With any student debt	39%	44%	4 pp	0.26	36%	41%	5 pp	0.04**	-1 pp
With any collection debt	56%	52%	-5 pp	0.20	47%	46%	-1 pp	0.71	-4 pp

SOURCE: Compass Working Capital administrative data, May 1, 2016–March 31,2020. TransUnion credit bureau comparison sample credit report data, annually October 31, 2016–October 31, 2019.
NOTE: "Any debt" excludes mortgage debt.
*/**/*** indicates statistically different between Compass FSS and comparison samples at the 10, 5, and 1 percent levels, respectively.

Appendix B: Complete Methodology

B.1 Methodological Approach

To provide context for interpreting Compass FSS participants' changes over time in FICO® Scores and debt levels, we obtained credit and debt data for individuals with similar characteristics in the same geographic areas from the Transunion Credit Bureau. These data provide benchmarks that suggest how FICO® Scores and debt levels might have changed over time in the absence of the Compass FSS program.

The ideal comparison group would have consisted of heads of household in federal rental assistance programs who were not enrolled in a Compass FSS program but would have been interested in participating if offered the chance to do so. However, credit and debt data for rental assistance program participants are not collected by HUD or identifiable from any third third-party source, so this option was not feasible. Instead, we obtained annual longitudinal, de-identified data from the TransUnion credit bureau on randomly selected individuals who met a set of criteria that we specified. TransUnion provided a comparison group of consumers in the same zip codes with similar ranges of FICO® Scores, debt, and demographic characteristics over time periods similar to those during which Compass FSS participants were in the FSS program (certain key demographic information, including race, ethnicity, marital status, and presence of children were not available for the TransUnion data). We also specified income criteria, but as noted below, the ability to match on income proved limited. We do not have information on whether these comparison individuals participate in rental assistance but assume that the majority do not. We also do not have information on whether or not the comparison individuals would have chosen to participate in Compass FSS or another similar program that offers to help them improve their financial situation.

We aimed to obtain a comparison group that was matched as closely as possible to Compass FSS participants by obtaining a stratified sample for each comparison cohort in which comparison individuals were selected within five ranges of FICO® Scores and estimated incomes. However, the income estimates available from TransUnion do not go below $18,000, and the average income among Compass households included in this study was only $18,719 at baseline, thus making it impossible to do a finely grained match by income.

Lacking the ability to match closely on rental assistance receipt and income, we decided not to select a single comparison group to serve as a benchmark for the Compass FSS participants, but instead to select a separate comparison group for each outcome of interest. This allowed us to produce comparisons using comparison groups that provided the closest available equivalence on outcome measures at baseline. For each of the outcomes of interest, we identified comparison households based on pre-test characteristics, including age, cohort, geographic group (zip code clusters for the PHAs and for the multifamily developments), and the outcome at baseline. For each Compass participant, we drew at least three comparison group members based on similarity of these baseline characteristics. For example, for the analysis of changes in FICO® Scores, we matched individuals from within the universe provided by TransUnion that had similar FICO® Scores to each Compass FSS participant when that participant enrolled in FSS.[5] We matched comparison group members to FSS participants that were in a matching cohort. To do this, we defined Compass FSS cohorts based on enrollment within six months (earlier or later) of the annual comparison group baseline data pulls. The cohort definition process is described more fully below.

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[5] To get the most appropriate match, we allowed replacement. In other words, if a comparison group member was a good match for more than one FSS participant, they are included in the comparison outcome data multiple times.

We further balanced the analysis by regression-adjusting differences in changes over time ("differences in differences") between the Compass FSS and comparison group member groups to account for remaining variation in baseline characteristics for the outcome of interest.[6]

The balance of this appendix describes (1) the data sources used for this analysis, (2) how we selected the comparison groups for whom TransUnion provided data, and (3) how we selected the comparison individuals for each outcome analysis to identify the best match of characteristics at baseline.

B.2. Data Sources

Our analysis of changes in FICO® Score and debt used two data sources.

Compass FSS Participant Data

Compass FSS participant data include information from credit reports that Compass FSS financial coaches obtain for each participant at enrollment and prior to each planned client meeting, with authorization from participants. These data are provided through the TransUnion credit bureau, so are most comparable to TransUnion consumer comparison data (rather than comparison data from another credit bureau or service).

Comparison Group Data

The comparison group is composed of individuals who have TransUnion annual credit report data from October 31, 2016 through October 31, 2020. We requested that TransUnion pull data for three cohorts based on their characteristics at the time of the cohort's initiation. Each cohort included 1,000 individuals, though additional matched sub-sampling (see above) meant that not all were included in the analysis.[7]

- The first cohort was selected based on characteristics of individuals' October 31, 2016 credit reports, with follow-up pulls of credit reports for October 31, 2017, October 31, 2018, October 31, 2019 and October 31, 2020

- The second cohort was selected based on characteristics of individuals' October 31, 2017 credit reports, with follow-up pulls of credit reports for October 31, 2018, October 31, 2019 and October 31, 2020.

- The third cohort was selected based on characteristics of individuals' October 31, 2018 credit reports, with follow-up pulls of credit reports for October 31, 2019 and October 31, 2020.

The individuals selected for each cohort were divided into five tiers based on individuals' FICO® Scores and estimated income, with a gender ratio of 89 percent female (similar to the share of female-headed Compass FSS households). In addition, at baseline (cohort formation) all individuals were between age

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[6]   We estimate variants of the following regression specification:

$$y_{it} = \beta_0 + \beta_1(Endline_t) + \beta_2(FSS_i) + \beta_3(Endline_t * FSS_i) + \beta_4(y_{i,t-1}) + \epsilon_{it}$$

Where we regress outcome *y* for each person *i* in time period *t* onto indictors for whether we observe a person at endline, an indicator for whether a person was a Compass FSS participant, and the interaction between these two indicators is the difference-in-differences estimator. Our preferred estimates include the baseline measure for the outcome of interest. We also include matching weights.

[7]   Compass FSS participants were mapped to cohorts in the following numbers: 164 in Cohort 1, 103 in Cohort 2, and 92 in Cohort 3. Because each Compass FSS participant was matched to 3 comparison group members for each analysis (with the possibility of matching comparison group members multiple times), the comparison group samples used in the analyses had effectively the same ratios between cohorts as did the Compass FSS groups.

25 and 58 and had no mortgage debt. Below, we provide the full description of the specifications for each tier.

We requested TransUnion data for the ZIP codes served by Metro Housing|Boston and the Cambridge Housing Authority, and where the POAH rental properties are located. For each zip code in the TransUnion data, we assigned a geographic indicator based on whether Metro Housing|Boston, the Cambridge Housing Authority, or POAH households are in that area. Importantly, we used these indicators to create our comparison group for Compass participants, allowing for comparisons within similar geographies.

B.3   TransUnion Cohort Formation Tiers

Below, we describe the cohort formation tiers, which TransUnion used to identify potential comparison group members for each cohort. Note that, following construction with these tiers, we conducted additional selection and adjustments to ensure a closer match of baseline characteristics and cohorts for each outcome analysis (as described above).

Within each of the three time cohorts and zip code groups (PHAs, POAH), TransUnion selected individuals with the following characteristics:

- Tier 1: TransUnion selected: 17.8 percent females and 2.2 percent males who do not have FICO® Score 8 at baseline and whose baseline estimated income between $0 and $28,000.

- Tier 2: TransUnion selected: 17.8 percent females and 2.2 percent males who have FICO® Score 8 below 554 at baseline, and who have baseline estimated income between $0 and $33,000.

- Tier 3: TransUnion selected: 17.8 percent females and 2.2 percent males who have FICO® Score 8 at baseline between 554 and 602, and who have baseline estimated income levels between $0 and $41,000.

- Tier 4: TransUnion selected: 17.8 percent females and 2.2 percent males who have FICO® Scores 8 at baseline between 603 and 656, and who have baseline estimated income between $0 and $42,000.

- Tier 5: TransUnion selected 17.8 percent females and 2.2 percent males who have FICO® Scores 8 at baseline above 656, and who have baseline estimated income between $0 and $41,000.

B.4   Limitations

Two main issues arise in comparing the TransUnion and Compass FSS data. First, the TransUnion data are consistently pulled as of October 31 while the pull date of the Compass FSS credit reports vary. Moreover, Compass FSS participants can enroll at any time during the year. For purposes of this benchmarking exercise, we use the October 31, 2016 data provided by TransUnion to match Compass households from May 1, 2016 through April 30, 2017, and apply a similar matching process for each subsequent year, matching the annual TransUnion data with Compass records for six months before and six months after the October 31 pull-date of the comparison sample (creating cohorts of continuous FSS enrollment to match the comparison group cohorts). There are two exceptions: we truncate the Compass data matched to the October 31, 2019 comparison pull by one month, to end on March 31, 2020; this was intended to minimize the effects of the pandemic. We add an additional year of Compass data in the secondary analysis, which is also truncated by one month, ending on March 31, 2021.

Second, as noted above, the proprietary income estimation process developed by TransUnion does not identify incomes below $18,000. It also does not estimate incomes for individuals without a credit score. The data provided by TransUnion include 11,109 records (of 12,000) with an income estimate, but only 7 records had incomes below $21,000. This is despite requesting data for people whose incomes fell between $0 and specified intervals (for example, $24,000). As a result, the estimated incomes of the

sample provided by TransUnion are significantly higher than those of the Compass FSS participants. On average, Compass FSS participants report incomes that are about $15,000 less than the TransUnion comparison group. These disparities are an important limitation of this analysis.

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