
Can Dynamic Interactive Design Improve Investment Disclosure?

MARCH 2020

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Introduction

In order to make sound financial decisions and adequately prepare to meet one's investment goals, it is critical that investors understand the performance and fees associated with their investment portfolio. Disclosure is a key regulatory tool aimed at transparency, with the goal of providing consumers with the information necessary for making informed decisions. To improve investors' awareness and understanding regarding their portfolio fees and performance, Canadian dealers recently began providing their clients with annual statements highlighting account-level fees and performance in accordance with the Canadian Securities Administrators (CSA) second round of changes to the Client Relationship Model (CRM2). Recent survey evidence suggests that these disclosures may be improving investors' knowledge regarding the fees they pay, and the performance they experience, on their investment portfolios – though many remain confused about these important topics.¹

Increasingly, financial disclosures are being delivered, and investment decisions made, in online environments. This presents both challenges and opportunities. Prior studies have suggested that screen-based reading behavior includes decreased sustained attention, and involves more time spent scanning, keyword spotting, and reading more selectively instead of in-depth.² Yet, online environments also allow for interaction and dynamic aids that may improve disclosure's efficacy relative to traditional paper based statements. Wu et al. (2014) find that using dynamic aids to highlight important information improved the performance of hospital students, and Gunaratne, Burke and Nov (2017) find that exposure to social annotations improve novice investors' portfolio allocation decisions and performance.³

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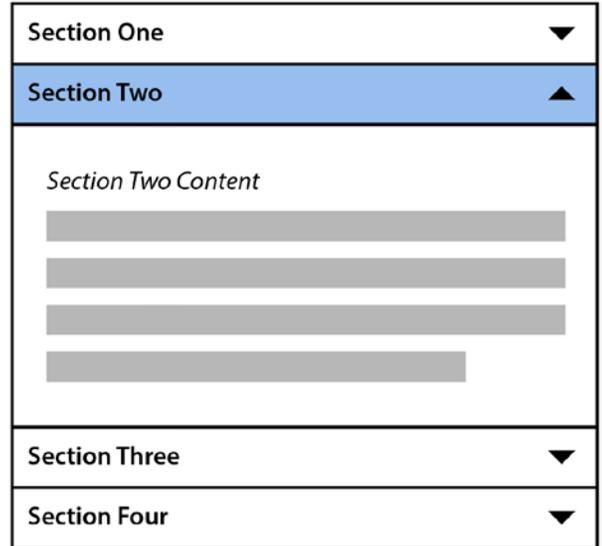
¹ Pollara (2017), "Canadian Mutual Fund Investors' Perceptions of Mutual Funds and the Mutual Funds Industry," Report prepared for the Investment Funds Institute of Canada; Innovative Research Group (2017), "Investor Readiness for Better Investing 2016 – 2017 Panel Study," Report prepared for the British Columbia Securities Commission.

² Liu, Z. (2005), "Reading Behavior in the Digital Environment: Changes in Reading Behavior over the Past Ten Years," *Journal of Documentation*, 61(6) – 700–712

³ Wu, L., Cirimele, J., Leach, K., Card, S., Chu, L., Harrison, T.K., and Klemmer, S.R., (2014) "Supporting Crisis Response with Dynamic Procedure Aids," in *Proceedings of the 2014 conference on Designing interactive systems*. ACM, 315–324; Gunaratne, J, Burke, J., and Nov, O., (2017) "Empowering Investors with Social Annotation When Saving for Retirement," *CSCW*, 1066–1081.

Figure 1: Standard Accordion Design

Accordion designs – which feature panels that contain a header and information in a collapsible body (Figure 1) – are a dynamic navigation pattern that aims to present multiple levels of information, reduce search complexity, and increase autonomy, while reducing the amount of information presented at any one time (potentially reducing cognitive load). Despite their ubiquity in other domains, little research has examined how this design may influence comprehension and subjective understanding of investment disclosure. In this study, we examine whether interactive accordion designs can improve investor understanding of CRM2 statements.



Stakeholder Interviews

A key decision in constructing and implementing an accordion design is how to scaffold the contained information. Particularly, one needs to decide how many panels to feature, what information to embed in the headers, and how to organize the subsections.

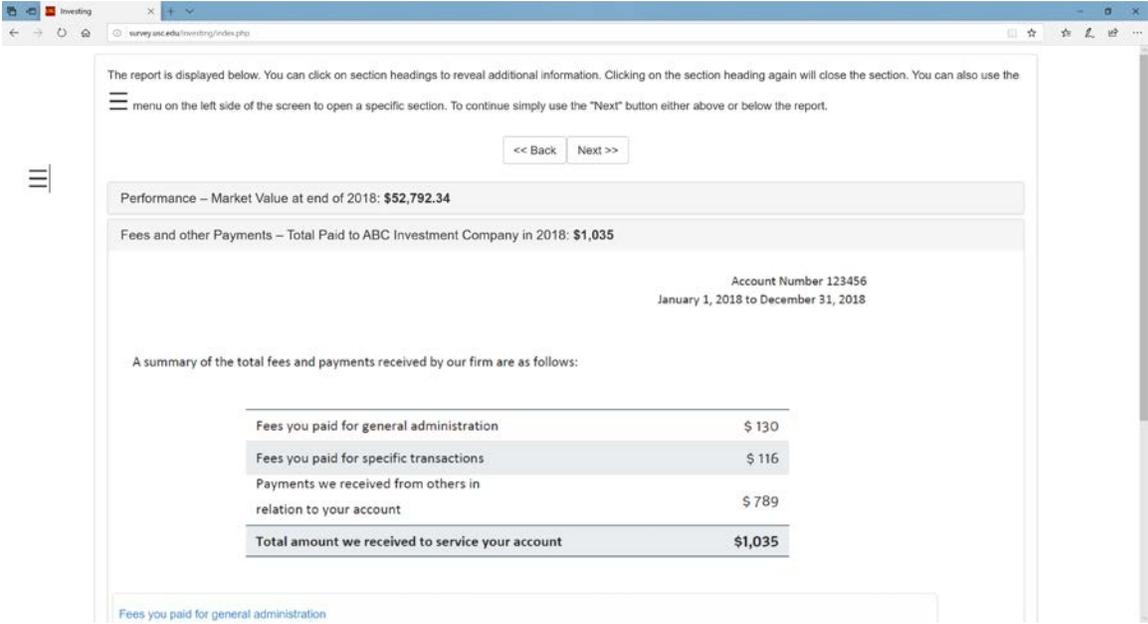
To inform our approach, we conducted eight semi-structured interviews regarding CRM2 disclosures drawing from a diverse range of participants and organizations, including the Ontario Securities Commission, the Mutual Funds Dealers Association, and registered dealer firms. The interviews were designed to solicit participants’ views on what information contained in CRM2 statements is (1) commonly of most interest to investors, and (2) most valuable for investors to understand. Though the individuals we consulted noted that all the material contained in the CRM2 statements is of value, two key pieces of information were routinely cited as being of most interest and importance to investors: current account value (and performance) and fees paid in dollar terms.

Accordion Design

Based on the insights we received from the interviews, we organized our accordion design into two primary panels – Performance and Fees – using the respective headers to make the information of interest as salient as possible (Figure 2). Underlying content was drawn from a modified version of the Investment Fund Institute of Canada’s CRM2 template for a hypothetical investment account at a fictional investment company (see

Appendix – Control Statement). The Performance header contained information on the current market value of the investment account, while the body of the section contained information on performance over the past year – including deposits, withdrawals, and rate of return. The Performance section featured three subpanels: Change in Market Value since account opening, Rate of return, and Additional information and notes.

Figure 2: Accordion Layout



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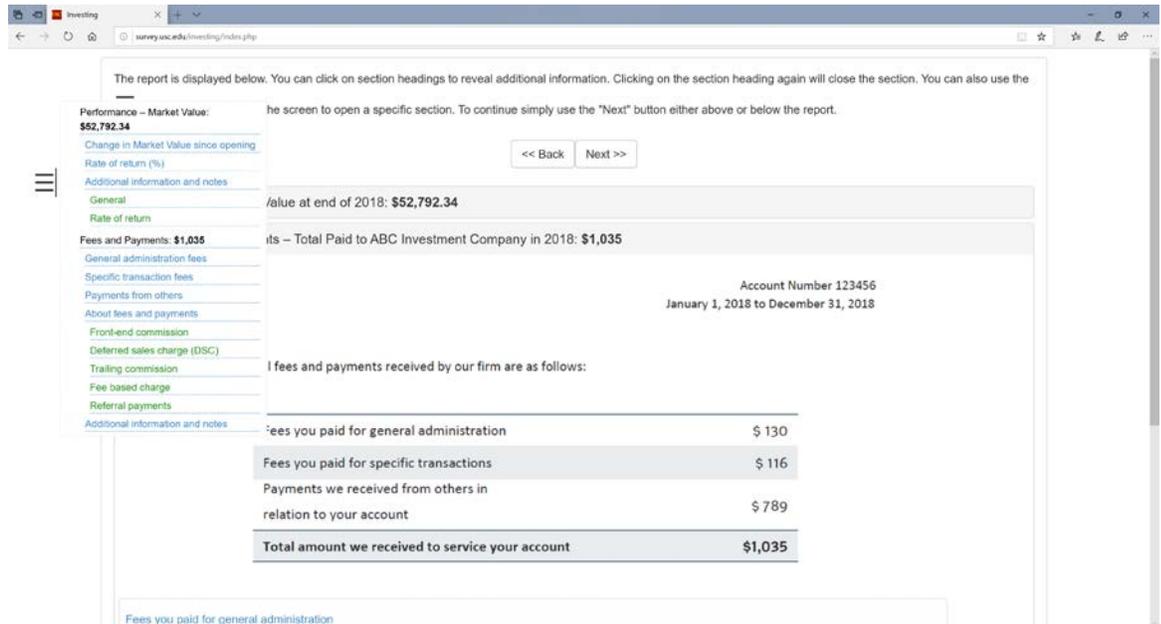
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The Fees and other Payments header captured the fees and payments to the fictional investment company, while the body of the section disaggregated the fees and payments into three components. The Fees section contained five subpanels – three subpanels corresponding to the component sections comprising fees and payments: General administration, Specific transactions, and Payments from others – and two subpanels providing further details and definitions: About fees and other payments received, and Additional information and notes. In addition to the collapsible panels, the accordion featured a navigational tool on the left to facilitate switching between sections (Figure 3).

Figure 3: Accordion Navigation



Experiment

To examine how accordion designs influence comprehension and subjective understanding of CRM2 disclosure statements, we conducted a randomized controlled trial with a sample of just over 1,000 Canadian investors. Average age in our sample was 52 years old, 43% of the sample were female, and 35% had a university certificate, diploma, or degree at bachelor level or above. Half the sample had a household income of \$75,000 CAD or less, and 45% of the sample reported that they were a novice investor or had no investing experience.

After completing a short survey eliciting the demographic characteristics described above, participants were presented with a CRM2 style disclosure and asked to review the information as if it were for their own account. Participants were randomized into one of two conditions: an **accordion** condition, in which participants had access to the disclosure statement in the dynamic navigation design; and a **control** condition, in which participants had access to the disclosure statement in the traditional format (a picture of the paper version available electronically). Importantly, the informational content was the same across conditions – only the format with which it was displayed and the interactive nature varied, allowing for a precise test of the impact of the accordion design.

Prior to viewing the statement, participants in the accordion condition had access to a brief tutorial video describing how to navigate through the report (Figure 4). Subsequently, participants were asked a series of questions about the information

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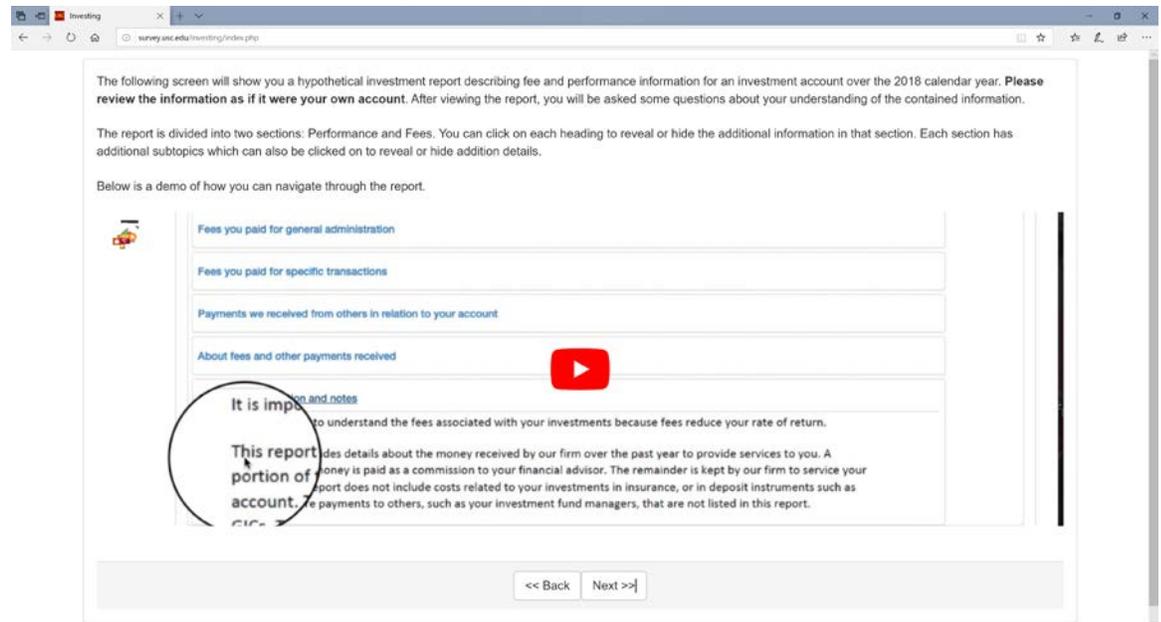
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contained in the disclosure and could reference the statement while answering if they wished.⁴

Figure 4: Accordion Introduction



Analysis

By chance, participants in the accordion condition were younger (mean difference = 3 years, p -value = 0.00) and more likely to report being a novice investor (mean difference = 5 percentage points, p -value = 0.11) than participants in the control condition. As a result, all of our analyses include the demographic covariates we elicited in our survey. We also include an indicator for whether the participant used a mobile phone to complete the experiment. We estimate regressions of the following form using ordinary least squares (OLS):

$$(1) Y_i = \alpha + \beta Treat_i + X_i' \gamma + \varepsilon_i$$

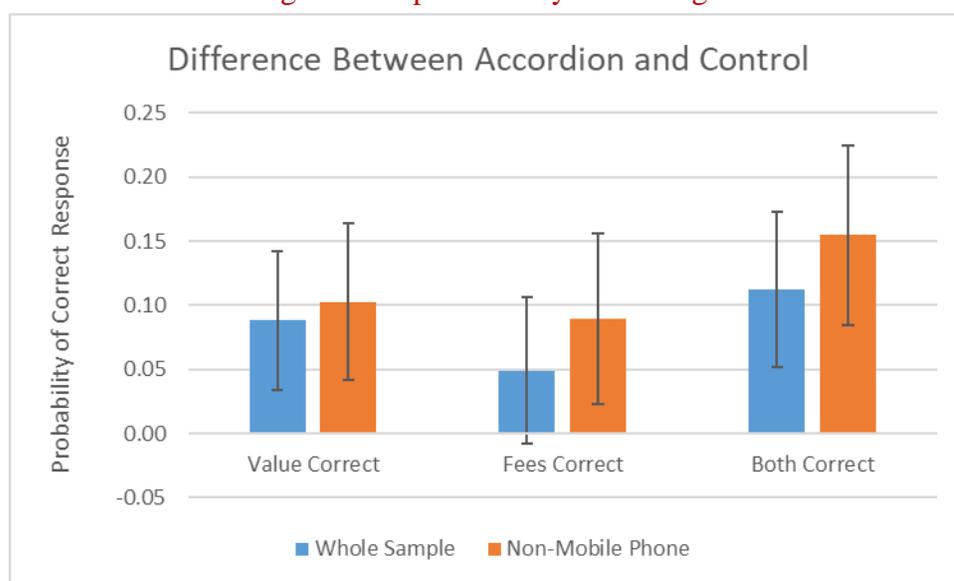
where Y_i captures an outcome of interest (such as comprehension of account value) for individual i , $Treat_i$ is an indicator variable denoting assignment to the accordion condition, and X_i' is a vector of demographic and financial characteristics. The coefficient of interest, β , captures the average effect of being randomly assigned to the accordion. We plot β across different regression specifications in all of the figures presented below.

⁴ See the Appendix for the full survey instrument.

Results

We find that the accordion design substantially improved participants' comprehension of the key-targeted information – value of the account and total fees paid. In particular, participants in the accordion condition were 9 percentage points more likely to correctly identify the current value of the account (control mean = 69%, p-value = 0.001), 5 percentage points more likely to correctly identify the total fees paid (control mean = 67%, p-value = 0.092), and 11 percentage points more likely to get both correct (control mean = 53%, p-value = 0.000).

Figure 5: Impact on Key Knowledge



Notes: The figure displays the estimated difference in probability of correct responses between the accordion condition and control. The error bars denote the 95% confidence interval.

We also find that the accordion design was more effective when used on a larger screen. Among respondents who did not use a mobile phone to complete the experiment, participants assigned to the accordion condition were 10, 9, and 16 percentage points more likely to correctly identify account value, fees paid, and both, respectively (all statistically significant at the 1% level).

While the accordion design improved knowledge in the key targeted dimensions, comprehension about information within each panel generally declined. On the entire 12 item quiz about the statement's content, those assigned to the accordion condition answered 0.37 fewer questions correctly, on average, than those assigned to control (control mean = 6.10, p-value = 0.080), though the difference is more muted (0.25 questions) and not statistically significant among the non-mobile phone sample.

The difference in knowledge on other areas of the statement may have been driven by reduced time spent with the accordion design. On average, those randomly assigned to the accordion condition spent 30 seconds less time viewing the statement than those in the control condition including the demo (control mean = 170 seconds, p-value = 0.012). Participants in the accordion condition also spent less time answering the knowledge questions, 7 seconds less on average (control mean = 28 seconds, p-value = 0.049).

Our results are consistent with an explanation that many participants were indeed most interested in account value and fees paid, and felt little need to further review when that information was made salient (though we are unable to directly measure thoughts or motivation). In fact, less than half (46%) of participants in the accordion condition clicked on at least one section in the accordion during the period in which they were asked to review their statement as they normally would. Thus, while the accordion design improved knowledge on these key dimensions and reduced the amount of time participants needed to ascertain this information, it came at a cost of decreased knowledge of other information contained in the statement.

Finally, at the end of the experiment participants were asked questions about their subjective comprehension, confidence in understanding, and the statement's ease of use. In particular, participants were asked to agree or disagree (on a seven point scale) with the following statements:

- The statement was easy to understand
- I am confident that I understand how the investment portfolio performed
- I am confident that I understand the fees charged
- I found it easy to find the information I was interested in

Respondents in the accordion condition rated ease of understanding 0.2 points higher than participants in control (marginally statistically significant, p-value = 0.056, control mean = 4.0). There were small (and not statistically significant) differences in responses to participants' confidence in their understanding of how the investment portfolio performed and the fees charged. Those randomly assigned to the accordion condition rated ease of navigation higher than those randomly assigned to the control statement by 0.11 points, consistent with the format being more navigable, though this difference is not statistically significant. Response patterns to the subjective questions were similar for mobile and non-mobile phone users.

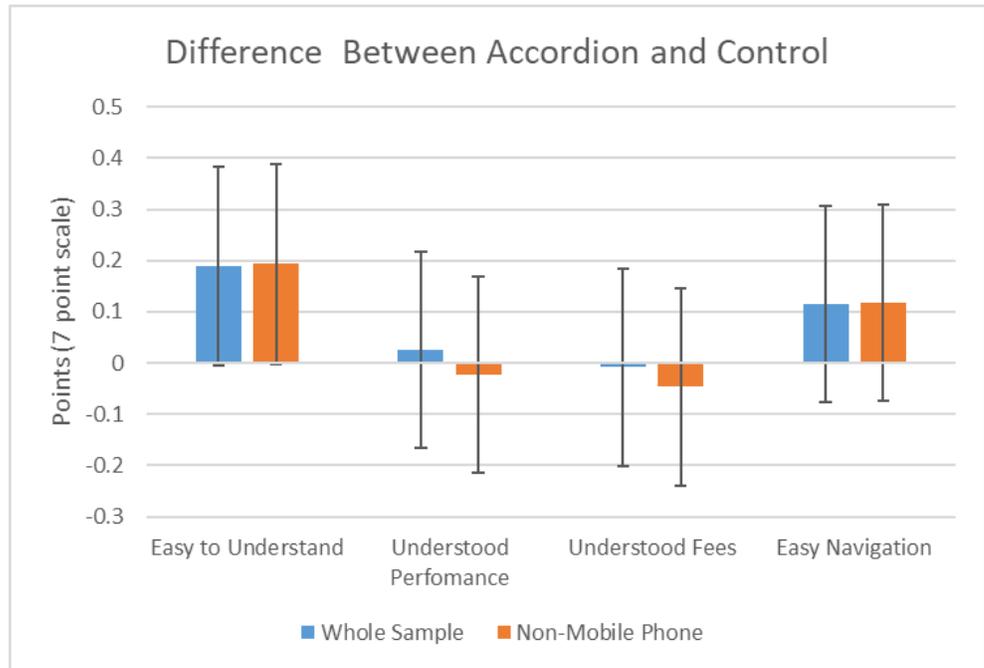
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Figure 6: Impact on Subjective Knowledge and Experience



Notes: The figure displays the estimated difference in probability of correct responses between the accordion condition and control. The error bars denote the 95% confidence interval.

Insights

Financial disclosures are increasingly being provided in online environments, expanding the possibilities for how information can be communicated to consumers. In this study, we took an interactive communication approach – we developed an interactive accordion design for a disclosure and examined how it influenced consumers’ comprehension, amount of time spent reviewing, and subjective understanding and ease of use relative to a disclosure in the standard format. We found that the accordion design improved knowledge on the two key targeted dimensions – participants in the accordion condition were 9 percentage points more likely to correctly identify the current value of the account, 5 percentage points more likely to correctly identify the total fees paid, and 11 percentage points more likely to get both correct. Participants in the accordion condition also spent less time reviewing the disclosure, took less time to respond to the knowledge questions, and rated ease of understanding higher than participants in the control condition. While the accordion design improved comprehension on the two key targeted dimensions and reduced the amount of time participants need to ascertain this information, it came at a cost of reduced knowledge on other parts of the disclosure (particularly information that was contained in subsections).

Thus, our results suggest that there may be a tradeoff to introducing accordion designs – they may increase knowledge in focal areas while reducing knowledge in areas relegated to reside below the fold. In situations where there are a few key pieces of information that are clearly of most importance, accordion designs may be particularly valuable. In areas where all information is of similar importance, the welfare implications of their use are less clear.

We also found that the accordion design performed better than a traditional design when viewed on a larger screen – knowledge in the two focal areas increased more, and comprehension on other areas reduced less, relative to control, when participants did not view the disclosure through a mobile phone. Thus, it may be possible to improve the efficacy of accordion style disclosures through an adaptive display that bifurcates consumers based on the manner in which they access the disclosure statement – allowing access to the accordion for individuals using a desktop, laptop, or tablet, and directing individuals using a mobile phone to an image of a paper statement.

Overall, we find that interactive accordion design disclosures hold promise as a more effective conduit of financial information. Our experiment demonstrated they have the capacity to improve understanding on key, focal topics and reduce the amount of time individuals need to ascertain this information. Additionally, future research may be able to improve upon the effects demonstrated in this study. As mentioned above, adaptive disclosures may be a particularly promising approach worthy of future investigation. A different scaffolding of information, grouping of content, and a more user-friendly interface may also improve efficacy. Many additional design modifications are possible, and are left to future research.

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Appendix – Control Statement

Account Number 123456
January 1, 2018 to December 31, 2018

March 1, 2019

Ms. Jane Doe
100 Any Street, Suite 1100 Town
Square Tower
Any City, Any Province L2L 3L0

Two New Reports About Your Investments

Dear Ms. Doe,

We are pleased to provide you with **two new reports** about your investments.

This **first report** provides details about the money received by our firm over the past year to provide services to you. A portion of this money is paid as a commission to your financial advisor. The remainder is kept by our firm to service your account. This report does not include costs related to your investments in insurance, or in deposit instruments such as GICs. There are payments to others, such as your investment fund managers, that are not listed in this report.

A summary of the total payments received by our firm are as follows:

Amount you paid for general administration	\$ 130
Amount you paid for specific transactions	\$ 116
Amount we received from others to provide ongoing services for your account	\$ 789
Total amount we received to service your account	\$1,035

This is the total amount received by our firm to provide services for your account.

In addition, over the past year, we received a referral fee of \$500 from John Smith for referring your financial planning business to them.

It is important to understand the fees associated with your investments because fees reduce your rate of return.

The **second report** we are providing to you is a performance report. The performance report tells you how well your investments performed. It will help you understand whether you are on track to meet your investment goals. For more information, please contact your financial advisor.

Sincerely,

ABC Investment Company

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Payments We Received on Your Account

Our Services	Cost (\$)	Total (\$)
Section 1: Amounts you paid for general administration of your account		
RSP administration	100	
Transfer fee	20	
Fee-based charge (see note below)	0	
De-registration/Re-registration	0	
Trustee fee	10	
Sub-Total: Section 1		130
Section 2: Amounts you paid for your specific purchase, sale or other transaction		
Fee for switching to different funds or products	10	
Mark-up fee	0	
Front-end sales commission (see note below)	106	
Sub-Total: Section 2		116
Total: Sections 1 + 2		246
Section 3: Payments we received from investment fund managers or others to provide services on your account		
Commission from investment fund managers for DSC investments (see note below)	503	
Management fee rebate (dealer portion)	0	
Payment from GIC issuers	0	
Trailing commission (see note below)	286	
Trailing commission rebate	0	
Sub-Total: Section 3		789
Total amount we received to service your account		\$1,035

Fee-based charge
– see note below

Total front-end commission – see note below

Total commission for investments with deferred sales charges
– see note below

Total trailing commission – see note below

Total amount received by our firm to provide services for your account

In addition, over the past year, we received a referral fee of \$500 from John Smith for referring your financial planning business to them.

About Commissions and Fees

Sales commission for investment funds may be paid either at the time of your initial purchase, or when you take money out of the fund.

- **Front-end commission:** Front-end commission is paid from your initial purchase before your money is sent to the investment fund manager. Over the past year, you paid **\$106** in this type of commission.
- **Deferred sales charge (DSC):** For some funds, your full deposit is sent to the investment fund manager. Upon receipt, the manager pays a commission to us. Over the past year, we received **\$503** in this type of commission for your investments. When you take your money out of the fund, you might pay a deferred sales charge to the investment fund manager for the commission that we received. Deferred sales charges usually decline to zero after a specific number of years.

Trailing commission: An investment fund pays the investment fund manager a “management fee” for managing the fund. Your investment fund manager pays a portion of the “management fee” to us for the services and advice we provide to you on an ongoing basis. The amount we receive is called “trailing commission” and is paid each year for as long as you own the fund. Over the 12-month period covered by this report, we received **\$286** in trailing commission for your investments. Part of the trailing commission is paid to your advisor to monitor your account and to provide you with advice. Be sure to seek this advice by talking to your advisor regularly about your account and your financial plans.

The trailing commission is paid by you indirectly. The costs of any investment are important, whether they are charged directly or indirectly, because they reduce your return. More information about management fees and other charges to your investment funds is included in the *Fund Facts* document for each fund. Ask your financial advisor or fund manager for a copy.

We are providing you with a separate performance report that shows your personal rate of return after costs have been deducted.

Fee-based charge: Some dealers receive commission from the investment funds manager and also charge a separate fee that you pay directly.

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March 1, 2019

Ms. Jane Doe
 100 Any Street, Suite 1100 Town
 Square Tower
 Any City, Any Province L2L 3L0

Your Investment Performance

Dear Ms. Doe,

This report tells you how your investments have performed with us as of December 31, 2018, after costs have been deducted. This information will help you understand whether you are on track to meet your investment goals.

Investment performance is affected by changes in the value of your investments, dividends and interest that they pay, and deposits to and withdrawals from your account.

Speak to your investment advisor if you have questions about this report. Be sure to tell your financial advisor if your personal or financial circumstances have changed. Your advisor can recommend changes to your investments to keep you on track to meeting your goals.

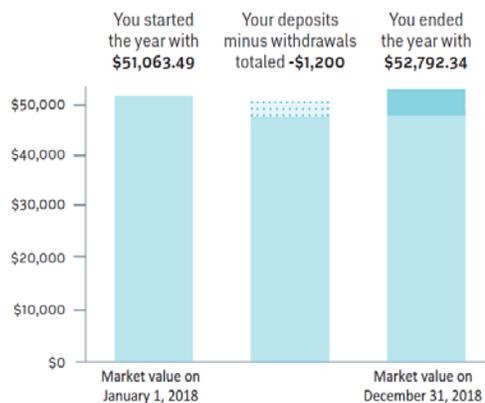
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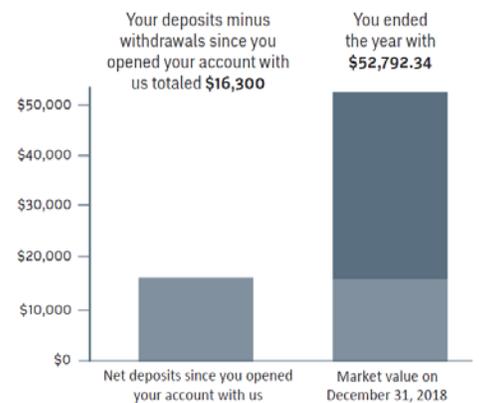
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Your investments increased by **\$2,928.85** during the past year. Your rate of return over the year is 5.51%.



Your investments increased by **\$36,492.34** since you opened your account with us. Your rate of return over this time is 13.09% per year.



► “Market value” is the price at which an investment can be sold on the open market at a specific point in time. If there is no active market for an investment, then we have estimated its value. If we cannot reasonably determine the market value then we have excluded that investment from the calculation of your return. The market value of an investment fund is its “Net Asset Value”. This is usually calculated by investment fund managers once per day.

Change in The Value of Your Account with Us

This table shows what has caused the value of your investments to change.

	Past year	Since you opened your account with us on 1/1/2011
Opening market value	\$51,063.49	\$0.00
Deposits	\$4,000.00	\$21,500.00
Withdrawals	\$ (5,200.00)	\$(5,200.00)
Change in the market value of your account	\$2,928.85	\$36,492.34
Closing market value	\$52,792.34	\$52,792.34

Your Personal Rates of Return

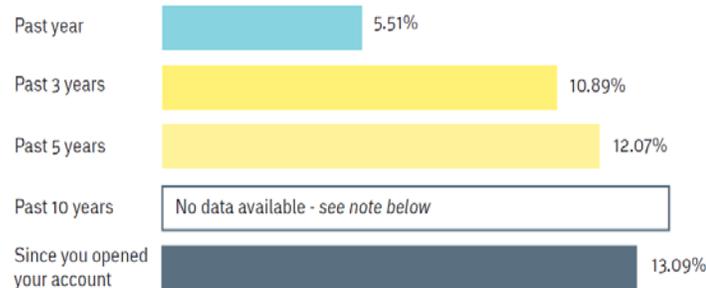
The chart below shows your personal **total percentage return*** after costs have been deducted, over different time periods, all ending on December 31, 2018.

Keep in mind that your returns reflect the mix of investments and risk level of your account. When you review your returns, consider your investment goals, the amount of risk you're comfortable with, and the value of the advice and services you receive.

The numbers are based on a common industry calculation known as the "money weighted" method. This method is the best way to understand how your investments have performed because it takes into consideration the timing of your personal deposits and withdrawals.

The calculation takes most dealer and fund manager costs into account. Most benchmarks do not reflect the costs of managing and operating the fund, so your personal rate of return is not directly comparable to a benchmark.

Your Personal Total Percentage Return



If you have a personal financial plan, it may contain a target rate of return, which is the target return to achieve your investment objectives within the timeframe set out in your financial plan. By comparing the rates of return you actually achieved (*shown in the chart*) with your target rate of return, you can see if you are on track to meet your investment objectives.

***Total percentage return** means the cumulative realized and unrealized capital gains and losses of an investment, plus income from the investment, over a specified period of time, expressed as a percentage.

Footnotes:

The 10-year figure is not available because your account was opened within the past 10 years. Due to changes in systems and record-keeping practices prior to 2016, some historical data is not available. This does not reflect guarantee information related to seg funds.

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Appendix – Survey Instrument

Screener Question:

Do you currently have one or more investment accounts? (e.g. mutual funds, stocks, ETFs, GICs, etc.)

Survey Questions:

- 1) What is your age?
- 2) What is your gender?
 - a. Female
 - b. Male
 - c. Other
 - d. Prefer not to say
- 3) What is the highest level of school that you have completed or the highest degree you have received?
 - a. No certificate, diploma or degree
 - b. High school diploma or equivalency certificate
 - c. Apprenticeship or trades certificate or diploma
 - d. College, CEGEP or other non-university certificate or diploma
 - e. University certificate or diploma below bachelor level
 - f. University certificate, diploma or degree at bachelor level or above
- 4) What is your annual household income (CAD)?
 - a. \$0 - \$24,999
 - b. \$25,000 - \$49,999
 - c. \$50,000 - \$74,999
 - d. \$75,000 - \$99,999
 - e. \$100,000 - \$149,999
 - f. \$150,000 - \$199,999
 - g. \$200,000 or more
- 5) What province do you live in?
 - a. Alberta
 - b. British Columbia
 - c. Manitoba
 - d. New Brunswick
 - e. Newfoundland and Labrador
 - f. Nova Scotia
 - g. Ontario

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- h. Prince Edward Island
- i. Quebec
- j. Saskatchewan
- k. Other, please specify

6) What platform are you using to take this survey?

- a. Mobile phone
- b. Tablet
- c. Laptop
- d. Desktop
- e. Other: (please specify)

7) What is your level of investing experience?

- a. No experience
- b. Novice
- c. Intermediate
- d. Advanced
- e. Expert

The following screen will show you a hypothetical investment report describing fee and performance information for an investment account over the 2018 calendar year. **Please review the information as if it were your own account.** After viewing the report, you will be asked some questions about your understanding of the contained information.

[Control] The report is four pages and you can scroll up and down to view the information.

[Treatment] The report is divided into two sections: Performance and Fees. You can click on each heading to reveal or hide the additional information in that section. Each section has additional subtopics which can also be clicked on to reveal or hide additional details. Below is a demo of how you can navigate through the report.

8) Are you finished viewing the report?

- a. Yes
- b. No

Please answer the following questions about the financial report you just viewed to the best of your ability. You may look at the report again to help you answer. You can use the link in the top right of each question screen to do so. Note: it will open in a new browser window. Please return to this browser window to respond to the questions after viewing the report.

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- 9) What information is contained in the financial report? Check all that apply
- a. Market value of the account
 - b. Asset allocation
 - c. Risk level of the account
 - d. Rate of return
 - e. Fees paid to ABC Investment Company
 - f. Don't know

- 10) What is the total amount of fees and payments received by ABC Investment Company for providing service to you in 2018?
- a. \$0 - \$499
 - b. \$500 - \$999
 - c. \$1,000 - \$1,499
 - d. \$1,500 - \$1,999
 - e. \$2,000 - \$2,499
 - f. \$2,500 - \$2,999
 - g. Over \$3,000
 - h. Don't know

- 11) What was the total market value of your investments at the end of 2018?
- a. \$0 - \$19,999
 - b. \$20,000 - \$39,999
 - c. \$40,000 - \$59,999
 - d. \$60,000 - \$79,999
 - e. \$80,000 - \$99,999
 - f. More than \$100,000
 - g. Don't know

- 12) What was the rate of return you experienced on your investments in 2018?
- a. 0% - 0.99%
 - b. 1% - 1.99%
 - c. 2% - 2.99%
 - d. 3% - 3.99%
 - e. 4% - 4.99%
 - f. 5% - 5.99%
 - g. 6% - 6.99%
 - h. 7% - 7.99%
 - i. Don't know

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13) How much did you **deposit** into your account in 2018?

- a. \$0 - \$999
- b. \$1,000 - \$1,999
- c. \$2,000 - \$2,999
- d. \$3,000 - \$3,999
- e. \$4,000 - \$4,999
- f. More than \$5,000
- g. Don't know

14) How much did you **withdraw** from your account in 2018?

- a. \$0 - \$999
- b. \$1,000 - \$1,999
- c. \$2,000 - \$2,999
- d. \$3,000 - \$3,999
- e. \$4,000 - \$4,999
- f. More than \$5,000
- g. Don't know

15) Did the fees you paid to ABC Investment Company reduce your rate of return?

- a. Yes
- b. No
- c. I didn't pay any fees to ABC Investment Company
- d. Don't know

16) How much did the market value of your account increase or decrease in 2018?

- a. Increased by \$0 - \$999
- b. Increased by \$1,000 - \$1,999
- c. Increased by \$2,000 - \$2,999
- d. Increased by \$3,000 - \$3,999
- e. Decreased by \$0 - \$999
- f. Decreased by \$1,000 - \$1,999
- g. Decreased by \$2,000 - \$2,999
- h. Decreased by \$3,000 - \$3,999
- i. Don't know

17) How much did you pay ABC Investment Company for specific transactions in 2018?

- a. \$0
- b. \$116
- c. \$130
- d. \$503
- e. \$1,035

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- 18) Which fee did you pay the most for in 2018?
- a. Trustee fee
 - b. Front-end sales commissions
 - c. Fee for switching to different funds or products
 - d. Mark-up fee
 - e. Transfer fee
 - f. Don't know
- 19) What is a trailing commission?
- a. A fee paid when you sell an investment
 - b. A "management fee" for ongoing advice and fund management
 - c. A fee paid at the time of initial purchase
 - d. A fee paid for referred business
 - e. A fee for account setup
 - f. Don't know
- 20) How was your rate of return calculated?
- a. Using the "time weighted" method
 - b. Using the "money weighted" method

To what extent do you agree or disagree with the following statements? [7 point scale, strongly disagree – strongly agree]

- 21) The statement was easy to understand
- 22) I am confident that I understand how the investment portfolio performed
- 23) I am confident that I understand the fees charged
- 24) I found it easy to find the information I was interested in

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