The goal for this case is to determine the most effective advertisement campaign for the bank: to send letter, to send letter with additional 1% on extra savings or no letters.

Actually, if we go through the overall values of saving and current accounts per period and group we can see that for group 3 the rise in deposits between 1st and 2nd periods is the biggest, and even in 3rd period the value of deposits remains really high, which at once leads to the idea that **sending a letter with additional 1% on extra savings is the most efficient strategy**.

To prove this statement we came up with the next statistical analysis. As the first step we compared mean values of deposit within group for every period to check descriptively whether these letters had an influence. We run t-test to check this. It showed that averages are approximately equal for all groups in the first base period, when no letters were sent. **But in second and third periods means were different for groups, according to the test we rejected hypothesis about equality of means**. As the next step we transformed variables deposits and current accounts into logarithm forms to eliminate inflation effect and to reduce variances. After that we started with pooled OLS and found out that serial correlation was present in residuals while the variance in residuals was the same (homoscedasticity). At that time F-test showed that fixed effect was present which leaded to running Hausman test to check whether RE regression was good enough. **The value of statistic was high, that’s why we rejected the null of random effects**. When errors are serially uncorrelated FE is more efficient than FD. If errors follow a random walk, then their differences are serially uncorrelated, and FD is better. But in this situation we don’t have one of such extreme cases, so we cannot easily compare the efficiency of the FE and FD estimators. But the coefficients do not differ greatly and FD consumes a lot of degrees of freedom.

**Within these results FE model with included interaction terms was chosen as the best:**

1. to get rid of fixed effect and as a result serial correlation in residuals,
2. to keep number of observations and get more precise estimations,
3. to measure an influence of gender and age adding interaction terms: period\*age and period\*gender.

Eventually, taking into account that STATA calculates FE regression in the special way with intercept term (an average estimation of fixed effect) the final equation looks like:

where and – averages for every individual, and – averages for the whole sample, and the structure is included in every variable of the model, even in period\*group variables.

Interpreting coefficients from the Figure 1 (Appendix) we see that 1% increase in CA leads to 0,05% increase in SA (saving accounts). Women bring 2% and 5% more money on SA than men in 2nd and 3rd periods respectively. Age estimations are small and are not statistically significant. Group 3 has about 6% and 7% higher rise in SA between 1st&2nd, 1st&3rd periods than group 1 respectively.

Summarizing, the analysis sheds light on the initial idea proving that extra 1% strategy is the best: **the rise in deposits between 1st and 2nd periods is highest for group 3, it keeps achieved level in period 3 and it is really significant.** Thereby, to be more precise this strategy is the most costly and information about costs is needed, but according to the analysis we strongly advise to send letter and consider well additional 1% on extra savings.

**APPENDIX 1.**

**Figure 1. FE model, significant levels.**

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**Figure 2. FE model, standard errors.**

