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A test of the Behavioral versus the Rational model of Persuasion in Financial Advertising

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Abstract

We present a test of the behavioral versus the rational model of advertising in the financial market. We analyze the Granger-causality relationship existing between Comit stock market index and advertising of financial products and services from the most important daily published financial newspaper in Italy. We run the test for both the risky and non-risky advertising, finding that the behavioral model of advertising is supported when risky financial products and services are considered, while the rational model is true for the non-risky. We ascribe this result to the dual process of reasoning: When investors evaluate the decision to buy risky financial products and services, they activate the automatic, rapid decision making process. The behavioral model of advertising copes with it and provides an advertising strategy that responds to market evolutions. When non-risky financial products and services are considered, a different mental process, requiring slow and sequential reasoning, operates, compatibly with a rational decision making process.

Keywords: advertising, stock market, dual process, financial institutions, risk

JEL-Classification: G02, G20, M37,O51

1. Introduction

Advertising is meant to convince people to make choices which favor the advertiser. But how do advertisers choose the persuasion model that will prove successful? In the rational/traditional model of the advertiser's behavior (Stigler, 1961, 1987), the advertising message conveys objective information that is useful to judge the product/service. Consumers use this information to update his/her beliefs about

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the product and decide his/her buying behavior. The rational consumer should interpret in a negative view the lack of disclosure of relevant information (Akerlof, 1970; Grossman et al., 1980).

On the opposite side, the behavioral model suggests that persuasion exerts leverage on the prevailing beliefs of the consumers (Petty and Cacioppo, 1986). Prevailing beliefs can be inaccurate, but it does not matter: *'In the behavioral model, far from trying to convince the audience that it holds erroneous beliefs, the persuader attempts to benefit from such beliefs'(Mullainathan and Shleifer, 2005).* The advertising message contains what consumers want to hear in that precise moment in time: The content can be misleading or incomplete without fear of negative reactions from the receivers which are not supposed to be perfectly rational, but with limited rationality, and consequently being prone to be influenced by emotions. Mullainathan and Shleifer (2005) find support of the behavioral versus the rational model of persuasion by looking at financial ads published on two popular American magazines (Business Week and Money) during the years of the internet bubble, from 1994-2003. They study the correlation between the content of advertising of mutual funds and the stock market index, considering this investment as a risky financial asset that should appeal to investors in periods when beliefs are optimistic: They find that the response of advertisers is related to the dynamics of stock returns as predicted by the behavioral model, finding a positive correlation between the growth of the stock market and the share of mutual funds ads promoting growth funds. More in general, (Mullainathan et al., 2008) test the behavioral versus the rational model of persuasion in a theoretical framework, exploring in particular the case of mutual funds advertising. They use the number and content of mutual funds advertising and find that advertising companies provide data about returns only when the stock market grows: Returns are associated with the idea of *grabbing an opportunity*, which in down markets cannot be associated with any state of mind that leads to buying more financial products. Even companies with positive past returns, decide to exclude this information from their advertising in negative stock market periods (Mullainathan et al., 2008).

Similarly to (Mullainathan et al., 2008; Mullainathan and Shleifer, 2005), we propose a test of the two competing model of advertising, the behavioral versus the traditional model. Differently from them, we suggest that the two models are not competing but complementary at least when considering decision making in financial markets. We believe that when faced with the decision to buy products and services provided by financial intermediaries, investors activate the dual process accounts of reasoning (Evans, 2003; Kahneman, 2011), depending on the type of product or service that they are facing. When investors evaluate the decision to buy risky financial products and services, they activate the automatic, rapid decision making process, heritage of animal evolution and generating behavioral responses to decisions.

In this case, the behavioral model of advertising is active, as suggested in (Mullainathan et al., 2008), as advertisers are aware of the fact that this mechanism is at work when considering this type of investments. The second process of reasoning is instead activated when non-risky financial products and services are considered: This mental process requires slow and sequential reasoning which is compatible with a rational decision making process.

We test our hypothesis with a set of Granger causality tests that study the timing between the dynamics of the stock market and advertising of financial products and services, categorized as Risky Financial products/services (RFP&S) and Non-Risky Financial products/services (NRFP&S). Data used in this paper are the number of ads made by financial intermediaries such as Banks, Insurance Companies, Brokers, Asset Managers on the most important Italian financial newspaper, from January 2006 to the end of March 2015 and the Milan Comit Global Price Index.

Psychological research supports our theoretical framework suggesting complementary strategies for the advertisement of risky and non-risky financial products/services. Studies on dual-process theories show that people use different thinking systems to attend to information (Epstein, 1994; Evans, 2003; Kahneman, 2003). In particular, System 1 is fast, intuitive, based on associations, and does not require much cognitive effort, whereas System 2 is slow, analytical, based on rules, and requires substantial cognitive resources (in terms of attention, memory, and self-control, (Kahneman, 2003)). Research also shows that people's decision-making, and in particular System 1, is often influenced by feelings (Slovic et al., 2004; Loewenstein et al., 2001). Consistent with the affect heuristic approach, feelings are quick, general reaction that determine whether a product is good or bad and have developed to help individuals make fast approach/avoidance decisions. Feelings are mostly processed through System 1 but can influence the slower deliberative thinking of System 2 when people try to analyze a decision more carefully (Slovic et al., 2004). When feelings are involved, because people are unsure about what to do and anticipate the regret of making a mistake, their ability to process information deliberatively and analyze the situation carefully are often reduced (Kahneman, 2011). This is exactly what should happen when people are assessing risky financial services/products that involve the possibility of making serious mistakes or incurring in a loss. Negative feelings enter the decision-making process and may steer it away from a particular product (Slovic et al., 2004; Greifeneder et al., 2010). As a consequence, advertisement for these products should counteract intuitive, affective reactions to overcome anticipated negative feelings by the investors. A way to make these product or services more attractive and induce people to update their beliefs is by taking advantage of a general positive sentiment of the market. During bull markets, investors tend to be a

little more overconfident (Statman et al., 2006), although they may also under-react to recent positive news (Barberis et al., 1998). Therefore, under these conditions, the behavioral approach should be more effective because it can make a risky financial product more attractive by inducing positive feelings and overcoming the last doubts that hold the investors back from purchasing them. Differently, when people are choosing non-risky financial products/services, they are unlikely to experience intense negative affective reactions since the risk of incurring a negative outcome is substantially lower. When a decision is not too affectively loaded, people are able to better focus their attention and process information deliberatively (Kahneman, 2011). As a consequence, the advertisement does not have to counteract fear or anticipated regret as much as provide objective information to help people understand which product suits their needs best.

We find support for our hypothesis. We find that the stock market precedes - Granger causes - investment in RFP&S advertising, while there is no lead effect of the stock market for NRFP&S advertising. On the contrary, the latter products appear to precede the stock market growth, suggesting that advertising firms anticipate stock market dynamics and the wealth effect that comes from it.

Our results are coherent with the theoretical framework of Mullainathan et al. (2008) which explores both the incentives of advertisers and investors in being rational versus behavioral. Although we cannot control for the actual effect of this advertising directly. Similarly to Mullainathan and Shleifer (2005) we implicitly assume that advertising firms are rational and are consequently investing efficiently on the type of advertising message that exactly matches the current preferences of the investors. The remainder of the paper is the following: Section 2 describes the database and the methodology used and Section 3 discusses results and concludes.

2. Methodology and Results

Advertisements by banks, insurance and financial companies can be grouped in two categories. The first, called Risky Financial Products and Services (RFP&S), includes advertising concerning investment products (mutual funds, pension funds, index or unit linked insurance polices, corporate bonds, ETF, certificates, covered warrants) or online trading platforms. In all these cases, the suggested investment decision will expose the ads receiver to some risk. The second one - that we call Non-Risky Financial Products and Services (NRFP&S) - includes all the residual advertising of financial products, such as checking accounts, bank deposits, payment services, loans, casualty insurance polices, brand ads. According to these definitions, we created a database collecting the number of advertising found in financial

Italian newspaper from January 2006 to the end of March 2015 that refer to RFP&S and NRFP&S. We also calculated a five days moving average of the advertising data series to eliminate seasonality and missing values due to holidays when the Newspaper is not available. We obtain 2401 observations for this variable.[1] For what concerns the stock market index, we use Milan Comit Global Price Index.

In order to verify our theory we test the following hypothesis:

HP 1. *The stock market index Granger-causes RFP&S advertising.*

HP 2. *RFP&S advertising does not Granger-causes the stock market index.*

The first two hypothesis provide a test of the behavioral model of advertising, similar to what Mullainathan and Shleifer (2005) do but with the advantage of using a Granger methodology which provides information on the timing of the relationship between the two variables rather than the simple association provided by the analysis of correlation. Moreover, we explore a wider range of financial products and services. With Hp. 1 we test whether the stock market dynamics influences the model of persuasion of financial advertisers inducing them to an increase or decrease of RFP&S advertising as a result of stock market ups and downs. Hp. 2 verifies that only one direction of causation is true.

HP 3. *The stock market index does not Granger-causes NRFP&S advertising*

HP 4. *NRFP&S Granger-causes the stock index dynamics*

Hp. 3 intends to verify whether a different type of reasoning is active in the decision process of advertisers when NRFP&S are considered. Hp. 4 suggests that not only stock market is not preceding the decision in NRFP&S advertising but also that advertising anticipates market dynamics, and the wealth effect that derives from an expectation of future positive/negative market returns.

The Granger Causality test (Granger, 1980) that we implement is the Toda and Yamamoto (1995) version which avoids the bias of invalid asymptotic critical values present when series are non-stationary or co-integrated. The procedure requires estimating an augmented VAR irrespective of whether the time series is integrated or co-integrated.[2] To do that, it is necessary to determine the optimal lag length for the estimated VAR, performed using standard information criteria. Provided that information criteria tests are highly sensitive to the number of lags used in the VAR estimation, and considering that the

[1] We excluded from the database Sundays and Mondays because these two editions do not contain stock market quotes.

[2] Notwithstanding that, the procedure requires to verify whether integration is present in the time series considered in the analysis. We verified this and found that the series are I(1). Results are available upon request to the authors.

choice of a number of lags which is less or more than the true lag length can cause biased estimates, we perform a battery of tests which include a number of lags from 6 to 25: The time span hypothesized for the timing of financial advertising responds to what is custom in reality, according to information obtained from operators of the field. Then we run a Modified Wald test for restrictions on the parameters of the VAR(p) model.[3]

We find the following results:

Result 1. *The stock market index anticipates the investment in RFP&S advertising. The reverse is not true.*

In Table 1, column (6) we see that the Wald test for rejecting the hypothesis that the stock market index does not Granger cause Advertising (which is the standard hp in Granger-causality test procedure), is significant at levels from 99% to 90% for a VAR model with lags from 10 to 22 included. Rejecting the Hp that the index does not Granger cause ads, means that the index Granger causes the ads for RFP&S ads, confirming Result 1.

Hp. 2 is verified in Table 1, column (3): the Wald test for rejecting the hypothesis that the ads do not Granger-cause the index is never significant at any lag.

Result 2. *NRFP&S advertising precedes the stock market dynamics. The reverse is not true.*

In Table 2, column (6) we report the results of the test performed with NRFP&S ads and the index. The results show no significant relationship emerging from this test. NRFP&S ads do not respond with a reaction to the dynamics of the stock market index, positive or negative. In Table 2, column (3) we observe that NRFP&S ads are strongly predictive of the stock index dynamics, provided that the hypothesis tested is rejected at all lag lengths.

3. Discussion

The results reported in the previous section provide evidence for our theory. First, Result 1 tells us that the behavioral model of advertising is true when RFP&S advertising is concerned. This confirms the results of Mullainathan and Shleifer (2005) and Mullainathan et al. (2008). Advertisers anticipate a trait of investors: When evaluating risky products and services, investors activate the behavioral model of decision making. Whether by the use of framing, co-categorizing or other behavioral rules, investors follow

[3]For an extended description of the procedure we remind the reader to Toda and Yamamoto (1995).

the *mood of the market* in their decision to buy risky financial products and services. Advertisers anticipate these emotional beliefs increasing the amount of advertising in RFP&S, as suggested by Mullainathan et al. (2008). Result 2 tells us that when NRFP&S are concerned, a different decision process is in place. Investors behave rationally when deciding about financial products considered non-risky. This is what the lack of connection with the stock market upswings tells us in Hp. 3. The result of the test of Hp. 4 tells us that it is even possible to predict the dynamics of the stock index using the number of NRFP&S. We ascribe this results to the dual system of belief, operating at the level of the investor and anticipated by the advertising industry. In a dual system of beliefs, subject switch their decision making process according to the type of activity they are engaged in. Advertisers are aware of this and use it as a strategic tool to sell their products. When faced with RFP&S, investors are fast thinkers that respond with investment strategies based on beliefs confirmation, framing and so on. On the contrary, when NRFP&S are concerned, investors activate a slow thinking process that allow them to strategize better and be rational. The result of Hp. 4 also suggests that we could predict the stock market using the number of non risky ads present in financial newspapers: The explanation is that advertisers anticipate the wealth effect that a stock market growth (or fall) can drive, increasing the number of advertising in NRFP&S in the periods preceding this dynamics. Risky financial products and services in turn are not specifically influenced by wealth effects, as risk aversion and in particular applied to the decision to invest in equities, is not univocally determined by the level of wealth, but by other factors such as the level of trust in the stock market (Guiso et al., 2008).

References

Akerlof, G., 1970. The market for lemons: Qualitative uncertainty and the market mechanism d. Quarterly Journal of Economics 84.

Barberis, N., Shleifer, A., Vishny, R., 1998. A model of investor sentiment. Journal of financial economics 49 (3), 307–343.

Epstein, S., 1994. Integration of the cognitive and the psychodynamic unconscious. American psychologist 49 (8), 709.

Evans, J. S. B., 2003. In two minds: dual-process accounts of reasoning. Trends in cognitive sciences 7 (10), 454–459.

Granger, C., 1980. Testing for causality. Journal of Economic Dynamics and Control 2, 329 – 352. URL http://www.sciencedirect.com/science/article/pii/016518898090069X

Greifeneder, R., Bless, H., Pham, M. T., 2010. When do people rely on affective and cognitive feelings in judgment? a review. Personality and Social Psychology Review.

Grossman, S., Hart, O., et al., 1980. Disclosure laws and takeover bids. Journal of Finance 35 (2), 323–34.

Guiso, L., Sapienza, P., Zingales, L., 2008. Trusting the stock market. the Journal of Finance 63 (6), 2557–2600.

Kahneman, D., 2003. Maps of bounded rationality: Psychology for behavioral economics. The American economic review 93 (5), 1449–1475.

Kahneman, D., 2011. Thinking, fast and slow. Macmillan.

Loewenstein, G. F., Weber, E. U., Hsee, C. K., Welch, N., 2001. Risk as feelings. Psychological bulletin 127 (2), 267.

Mullainathan, S., Schwartzstein, J., Shleifer, A., 2008. Coarse thinking and persuasion. The Quarterly Journal of Economics 123 (2), 577–619.

Mullainathan, S., Shleifer, A., December 2005. Persuasion in finance. NBER (11838). URL http://www.nber.org/papers/w11838

Petty, R. E., Cacioppo, J. T., 1986. The elaboration likelihood model of persuasion. Springer.

Slovic, P., Finucane, M. L., Peters, E., MacGregor, D. G., 2004. Risk as analysis and risk as feelings: Some thoughts about affect, reason, risk, and rationality. Risk analysis 24 (2), 311–322.

Statman, M., Thorley, S., Vorkink, K., 2006. Investor overconfidence and trading volume. Review of Financial Studies 19 (4), 1531–1565.

Stigler, G. J., 1961. The economics of information. The journal of political economy, 213–225.

Stigler, G. J., 1987. Theory of price.

Toda, H. Y., Yamamoto, T., 1995. Statistical inference in vector autoregressions with possibly integrated processes. Journal of econometrics 66 (1), 225–250.

4. Tables and Graphs

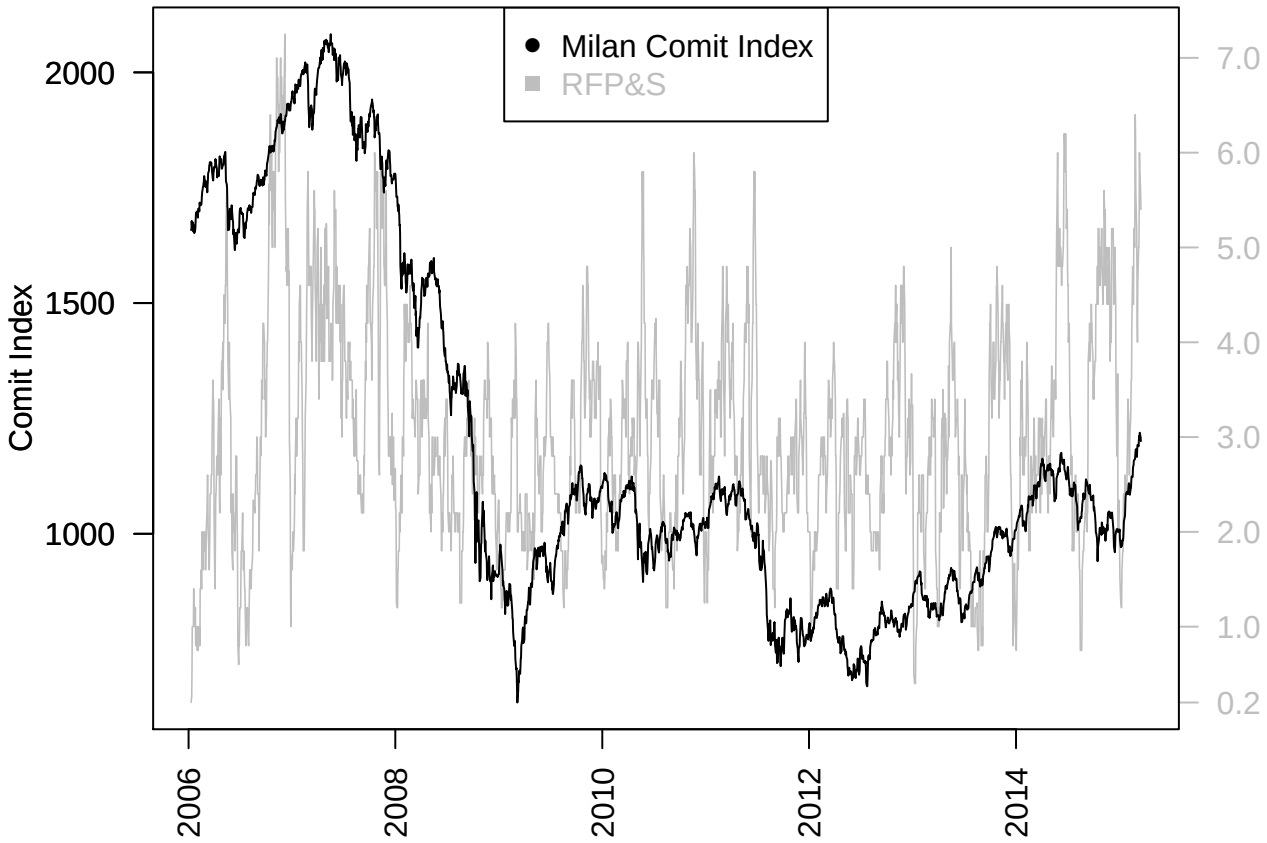

Figure 1: Risky financial products and services (RFP&S) advertising and Milan Comit index

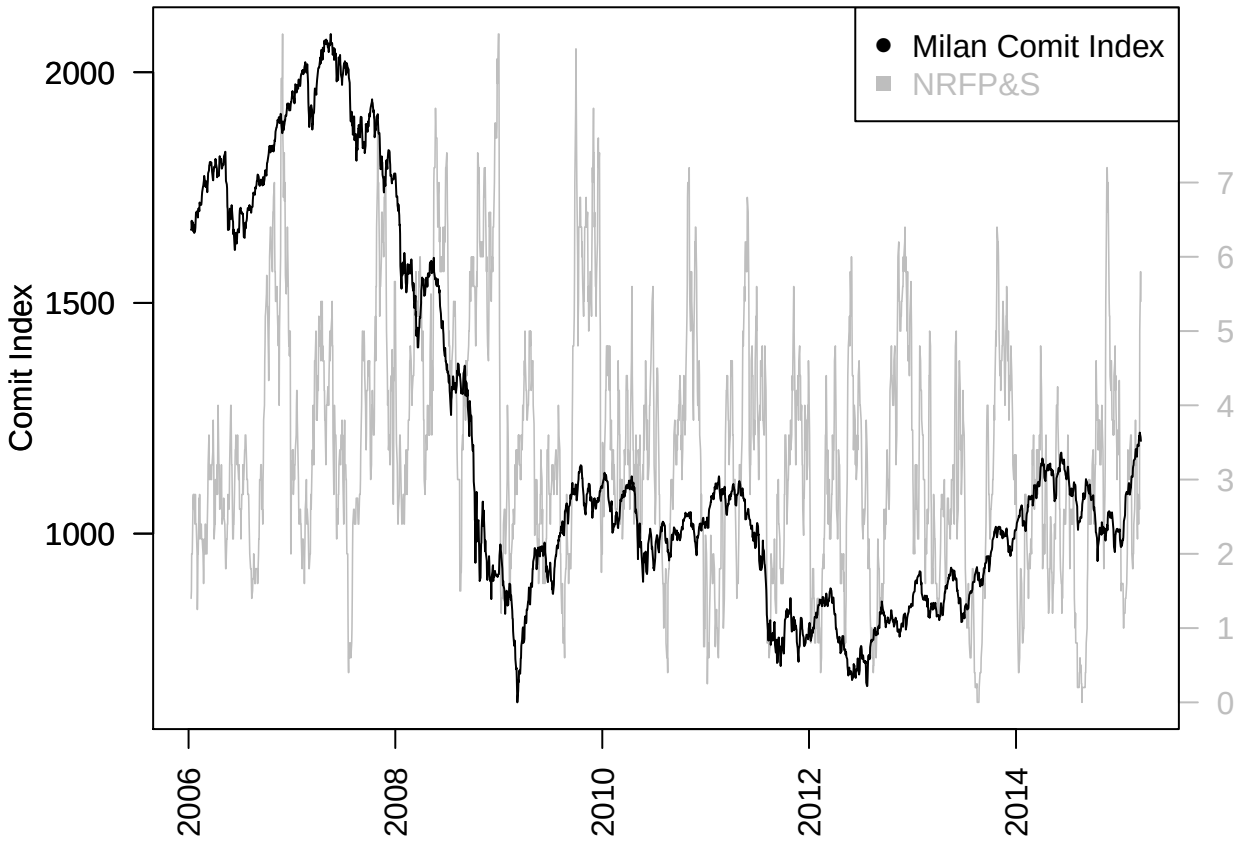

Figure 2: Non risky financial products and services (NRFP&S) advertising and Milan Comit index

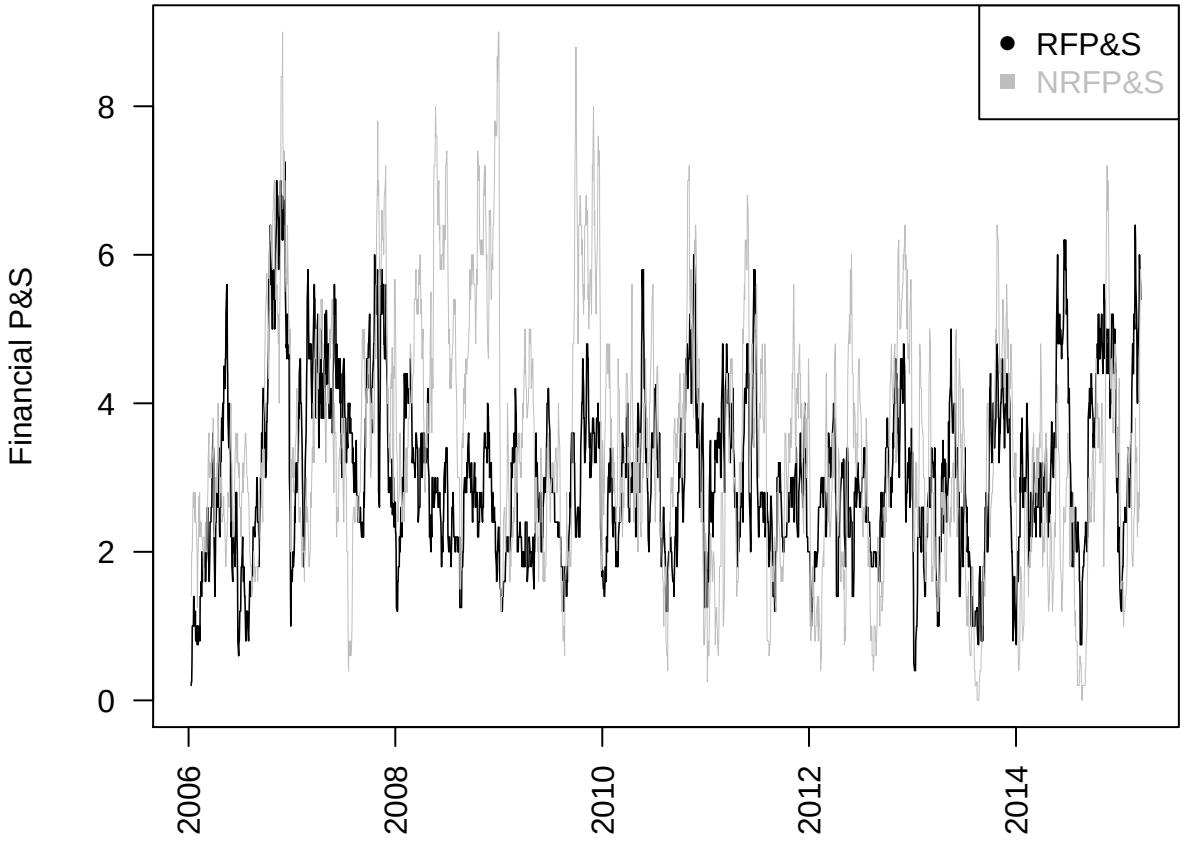

Figure 3: RFP&S and NRFP&S

Table 1: Granger Causality test between risky financial products and services and Milan Comit index

H0: Adv. does not Granger-cause Index			H0: Index does not Granger-cause adv.		
chi2	df	P	chi2	df	P
(1)	(2)	(3)	(4)	(5)	(6)
7.169	5	0.208	7.497	5	0.186
8.359	6	0.213	9.429	6	0.151
9.264	7	0.234	9.508	7	0.218
9.363	8	0.313	9.151	8	0.330
10.211	9	0.334	11.604	9	0.237
10.943	10	0.362	26.500	10	0.003***
11.340	11	0.415	26.810	11	0.005***
11.313	12	0.502	26.826	12	0.008***
11.641	13	0.557	27.261	13	0.011**
12.812	14	0.541	27.228	14	0.018**
13.846	15	0.537	27.416	15	0.026**
14.614	16	0.553	28.104	16	0.031**
21.023	17	0.225	29.887	17	0.027**
21.736	18	0.244	29.516	18	0.042**
23.288	19	0.225	30.595	19	0.045**
23.068	20	0.285	30.469	20	0.063*
25.018	21	0.246	30.812	21	0.077*
25.065	22	0.294	31.987	22	0.078*
25.351	23	0.332	32.023	23	0.100
24.799	24	0.417	31.943	24	0.128

Notes: Wald test for Granger Causality Test according to Toda and Yamamoto (1995) procedure between RFP&S and Milan Comit index. VAR estimation with 25 lags; constant and trend included. Tests results reported for lags from 5 to 24. Sample size n=2372. Symbols $***$, $**$, and $*$ indicate significance at the 1%, 5% and 10% level, respectively.

Table 2: Granger Causality test between non-risky financial products and services and Milan Comit index

H0: Adv. does not Granger-cause Index			H0: Index does not Granger-cause adv.		
chi2 (1)	df (2)	P (3)	chi2 (4)	df (5)	P (6)
13.818	5	0.017**	9.970	5	0.076*
15.771	6	0.015**	9.883	6	0.130
16.651	7	0.020**	10.048	7	0.186
17.635	8	0.024**	10.079	8	0.260
22.298	9	0.008***	10.335	9	0.324
22.793	10	0.012**	10.614	10	0.388
26.750	11	0.005***	13.134	11	0.285
26.490	12	0.009***	13.726	12	0.319
26.564	13	0.014**	15.156	13	0.298
34.025	14	0.002***	16.617	14	0.277
35.522	15	0.002***	14.185	15	0.512
37.121	16	0.002***	15.389	16	0.496
38.228	17	0.002***	17.279	17	0.436
38.452	18	0.003***	17.528	18	0.487
40.039	19	0.003***	17.475	19	0.558
44.259	20	0.001***	17.387	20	0.628
45.300	21	0.002***	18.726	21	0.603
48.278	22	0.001***	19.321	22	0.625
49.259	23	0.001***	19.909	23	0.647
49.864	24	0.001***	23.129	24	0.512

Notes: Wald test for Granger Causality Test according to Toda and Yamamoto (1995) procedure between NRFP&S and Milan Comit index. VAR estimation with 25 lags; constant and trend included. Tests results reported for lags from 5 to 24. Sample size n=2372. Symbols $***$, $**$, and $*$ indicate significance at the 1%, 5% and 10% level, respectively.

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