Model Documentation for:

Getting trapped in the suppression of exploration: A simulation model

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The model was developed in VENSIM software. The full model, in terms of stock and flows, is given on the next page (Figure 1). The model, grounded in the literature, was subjected to sensitivity analyses and also served to run history-replicating and history-divergent simulations (see the manuscript for the main results).

The theoretical background of the model can be summarized as follows. First, the model considers the dynamic effects of aligning exploitation and exploration with environmental aspects. Second, we assume exploitation and exploration activities are two ends of one continuum that are constrained by a shared set of (limited) resources. Third, the model focuses on the capabilities of top management to signal environmental changes and translate these into a balanced portfolio of exploitation and exploration projects. In this respect, we assume the existence of an 'optimal' (i.e. most profitable) exploitation-exploration balance. This managerial capability arises from the interaction between top management and the Board of Directors. Fourth, myopic forces limit the speed in which strategic changes are made. Finally, we assume the firm in our model is technically fit; that is, the model focuses on the firm's evolutionary fitness and, as such, on top management's capability to align the exploitation-exploration mix with the environmental context.

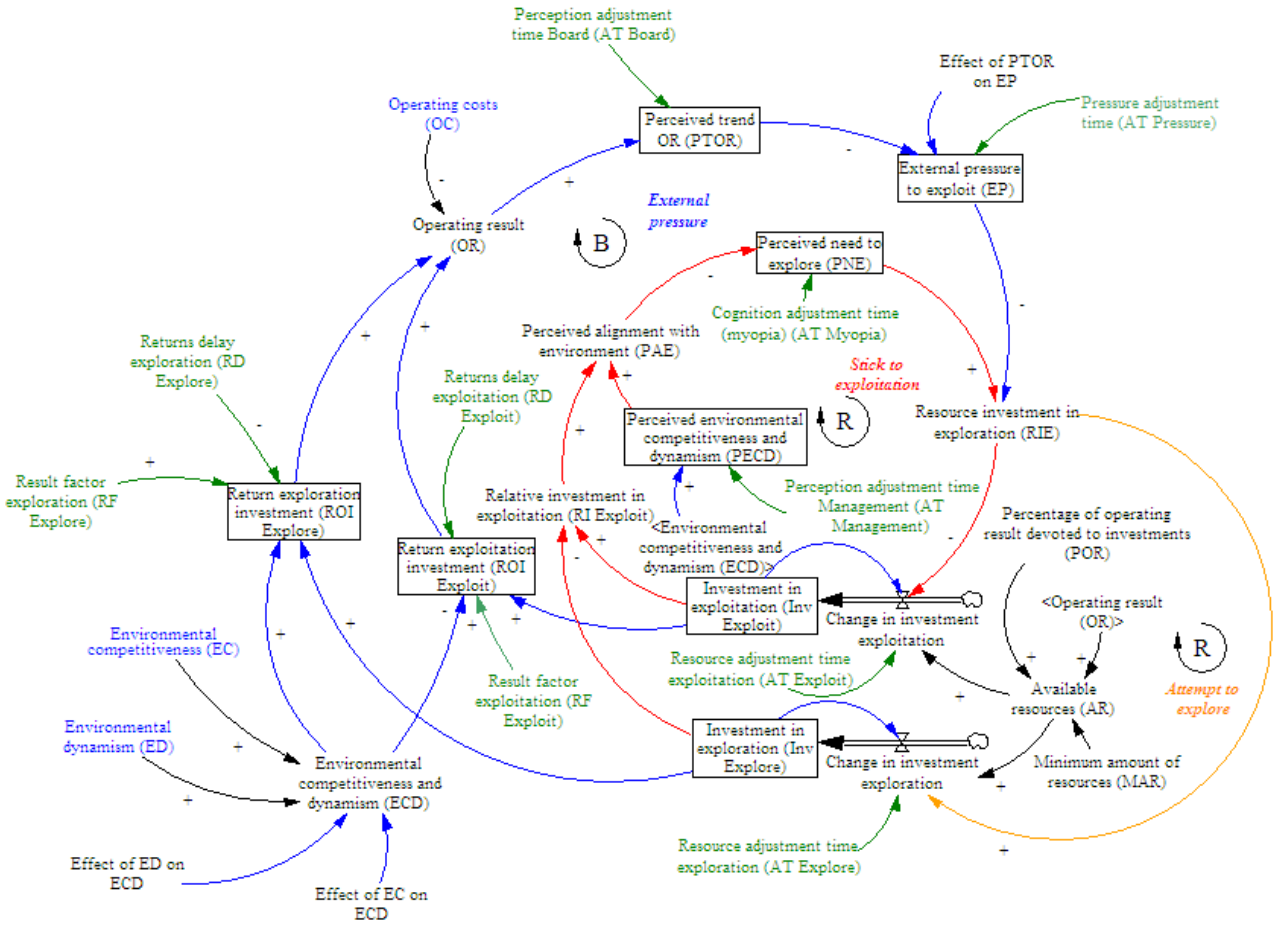


Figure 1: Overview of the complete model

The three feedback loops, as discussed in the manuscript, are given in different colors with the variable names written in black. The 'External pressure' feedback loop is depicted in blue, the 'Stick to exploitation' feedback loop in red, and the 'Attempt to explore' feedback loop in orange. Please note that the External pressure and Stick to exploitation loops overlap (from RIE to Change in investment exploitation). Moreover, the Attempt to explore feedback loop overlaps a critical part of the External pressure loop (from Inv_Explore to RIE). The blue variables denote exogenous influences. The green variables indicate adjustment times (delays). The unit of time in the model is weeks and the total simulation time was 800 weeks (slightly more than 15 years). The simulation algorithm was Euler's method with a step size (dt) of 0.25 weeks.

Section 2 of this document describes all equations of the formal model in detail. Subsequently, we provide an overview of the model settings and the sensitivity of the calibrated variables. Section 4 explores whether the model should be deterministic or stochastic.

1. Model description

Capabilities are often a matter of degree (Winter, 2000), and can therefore be modeled as continuous variables. In our model, the balance between exploration and exploitation (comprising organizational ambidexterity) is determined by the distribution of the available resources (AR) over the two ends. Following our assumption described in the previous section, the amount of AR, an auxiliary variable, is finite: it is calculated as a certain percentage (POR) of the operating result (OR) in a current period. Nevertheless, we assume a minimum amount of resources (MAR) that will be available even when the OR is negative or very small. MAR, an exogenous constant (set to 0.5), prevents negative amounts of AR and thus simulation errors. In order to achieve this, the 'MAX' function is used. This function assesses if the calculated AR is greater than the MAR and then returns the calculated value (if true) or an assumed fixed minimum amount of resources (MAR) (if false). (Note that MAR does not influence the process theory as outlined in the paper because a negative OR will only occur at the very end of the described sequences of events.)

(1) $AR = MAX (OR * POR, MAR)$

The percentage of the AR invested in exploration is captured by the variable 'Resource investment in exploration' (RIE) (see function 17). The stock 'Investment in exploitation' (Inv_Exploit) refers to the amount of resources invested in exploitation in the current period. On the other end of the continuum, the stock 'Investment in exploration' (Inv_Explore) denotes the level of resources allocated to exploration in the current period. Recent studies show that implementing new innovation strategies and thus routines is not simple; moreover, it takes considerable time and effort before these strategies and routines become effective (e.g. Durmusoglu et al., 2008). The desired resource adjustment is therefore subject to an adjustment time (AT) (exogenous constants). The AT is shorter for exploitation (AT_Exploit) than for exploration (AT_Explore), since it involves more radical changes to the routines. This gives the following equations:

Change in investment exploitation:

(2) $d (Inv\_Exploit) / dt = ((1 - RIE) * AR – Inv\_Exploit) / AT\_Exploit$

Change in investment exploration:

(3) $d (Inv\_Explore) / dt = (RIE * AR – Inv\_Explore) / AT\_Explore$

The exogenous variable 'Environmental competitiveness' (EC) represents the level of competition in the firm's environment and captures the number and strength of competitors in the current period. This exogenous variable ranges from 0 (monopolistic) till 1 (highly competitive). The EC variable was estimated by calculating the Herfindahl index for the case firm. This index is calculated by subtracting the

sum of the squared market shares from one. This is captured by the following equation, where s_i is the market share of firm i in the market, and N is the number of firms:

(4) $$EC_i = Herfindahl\ index = 1 - \sum_{i=1}^{N} s_i^2$$

'Environmental dynamism' (ED) is an exogenous variable representing the level of dynamism in the market in the current period. It ranges from 0 (extremely lethargic) to 1 (extremely dynamic). This variable was estimated by rescaling the S&P 500 index (from the beginning of 1994 till the ending of the 3rd quarter of 2009). More specifically, the S&P 500 growth rate was calculated for every t (with $t_0 = 1$) and the result subtracted with 1. (This latter is done because the initial situation is assumed stable and the starting values of ED should therefore be close to 0, rather than 1.) This operation is captured by gr. The resulting data set (ranging from 0.0 to 2.3) was then divided by x to ensure fit with the given range for ED. Lastly, the moving average over 26 weeks was taken in order to smooth out any non-systematic changes. This results in the following algorithm, where x will equal 3:

(5) $$ED_t = \frac{1}{26} \sum_{i=t}^{t+25} \frac{gr_t}{x}$$

The variable 'Environmental competitiveness and dynamism' (ECD) represents the state of the environment in the current period, which determines the most appropriate exploitation-exploration mix at a specific moment in time. ECD is a continuous variable ranging from 0 (extremely stable) till 1 (extremely instable). The ECD variable is determined by the two exogenous variables EC and ED. More specifically, the two lookup variables 'Effect of EC on ECD' and 'Effect of ED on ECD' capture the influence of EC and ED on ECD. Concerning the former, the S-curve (see Figure 2) represents the situation in which high levels of dynamism bring along the need for exploitation, while low levels of dynamism need a more balanced portfolio of exploitation and exploration activities. Concerning the latter, the S-curve (see Figure 2) captures that high levels of dynamism require more exploration efforts, while low levels of dynamism demand (mostly) exploitation initiatives.

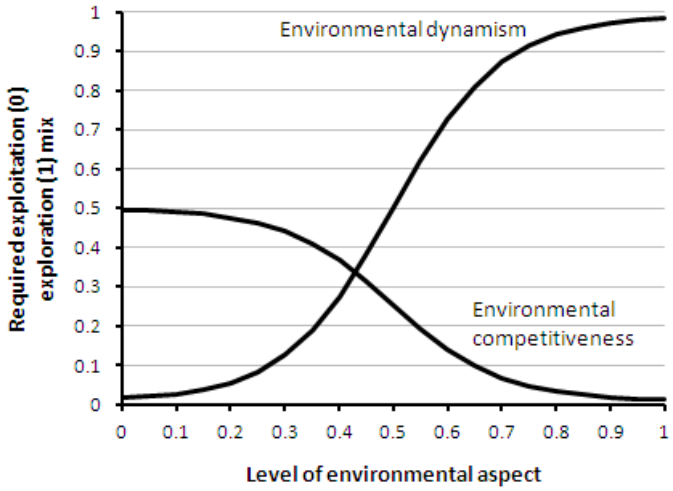


Figure 2: Effect of EC and ED on the required exploitation-exploration mix

As argued in the main text, the ED variable has more influence on the appropriate mix than the EC variable which results in the following formula (note the two lookup functions) (where ω is the weight factor, which is equal to 2/3 in our case):

(6) $ECD = \omega * Effect\ ED\ on\ ECD\ (ED) + (1- \omega) * Effect\ EC\ on\ ECD\ (EC)$

The ECD variable thus captures the assumed 'optimal' balance between exploitation and exploration and is the basis for both the reinforcing 'Stick to exploitation' and the balancing 'External pressure' loop.

Stick to exploitation

In general, perceptions tend to adjust to new circumstances with a certain delay, which can be modeled in terms of the behavior of a first-order adaptive system (Sterman, 2000). Top management's perception of the environment, denoted by the stock 'Perceived environmental competitiveness and dynamism' (PECD), is thus subject to such a delay. This variable captures the perceived environmental situation in the current period. The delay is specified by the variable 'Perception adjustment time Management' (AT_Management) (an exogenous constant).

Change in PECD:

(7) $d\ (PECD) / dt = (ECD – PECD) / AT\_Management$

The operational balance between exploitation and exploration in the current period is captured by the variable 'Relative investment in exploitation' (RI_Exploit). The balance is given in terms of the relative investment in exploitation. Since both Inv_Exploit and Inv_Explore denote the investments in respectively exploitation and exploration at a certain time, RI_Exploit is calculated by dividing the Inv_Exploit by the sum of Inv_Exploit and Inv_Explore.

(8) *RI_Exploit = Inv_Exploit / (Inv_Exploit + Inv_Explore)*

From the PECD and the RI_Exploit, the 'Perceived alignment with the environment' (PAE) can be calculated. Here, 1 implies a perfect alignment, while 0 means no alignment at all. (Please note that the kind of manufacturing firm modeled typically does not have very low values for RI_Exploit, given the importance of efficiency.)

(9) *PAE = 1 – (RI Exploit * PECD)*

Subsequently, the PAE triggers managerial action – denoted in the stock 'Perceived need to explore' (PNE). This variable constitutes the cognitive aspect of the behavior of top management in the current period. More specifically, it denotes top management's perceived appropriate balance in the current period. Due to inertial forces (AT_Myopia; an exogenous constant), PNE is subject to a first-order delay.

(10) *d (PNE) / dt = (1 – PAE – PNE) / AT_Myopia*

External pressure

The alignment between the exploitation–exploration mix and the environment influences the return on investment (ROI), and thus the operating result of the firm. In that respect, heavy investments in exploration, when the environmental situation demands more exploitation, will result in an inferior return on (exploration) investments. We thus consider two ROIs, one for exploitation and one from exploration investments. The former one is captured by the stock 'ROI_Exploit' while the latter one is denoted by the stock 'ROI_Explore'. Both capture the level of ROI in a current period. Moreover, this sequence of events (from investments to operating results) takes place with a certain delay because initial investments have to be transformed into (money generating) innovation. This delay is smaller for returns related to exploitation (exogenous constant RD_Exploit) than it is for exploration (exogenous constant RD_Explore), since the latter needs significantly more time to generate market success (Burgelman et al., 2004). Moreover, investments made in exploration that are aligned with the environmental situation (i.e. the alignment between the exploitation-exploration investments and the ECD; see functions 11 and 12) yield a higher return on investment (Jansen et al., 2006; Uotila et al., 2009). For example, the identification of a new market can, most likely, make a larger (positive) financial impact than the incremental improvement of a product in an existing market. Therefore, two different constants are needed to create a distinction between ROIs from exploitation and exploration: 'Result factor exploitation' (RF_Exploit) and 'Result factor exploration' (RF_Explore).

Change in ROI_Exploit:

(11) *d (ROI_Exploit) / dt = (Inv_Exploit * (1 – ECD) * RF_Exploit – ROI_Exploit) / RD_Exploit*

Change in ROI_Explore:

(12) $d\,(ROI\_Explore) / dt = (Inv\_Explore * ECD * RF\_Explore - ROI\_Explore) / RD\_Explore$

OC denotes the 'Operating costs' (an exogenous constant), and OR (a variable) is a function of:

(13) $OR = ROI\ Exploit + ROI\_Explore - OC$

Shareholders (the board) also perceive the ORs with a certain delay, implying the use of a first-order adaptive system regarding the trend of the OR. The perceived trend in the OR (captured by the stock PTOR) is therefore calculated as the average (thus delayed) fractional growth rate (which is negative for decline). As such, it provides a simple trend estimate for the currently perceived OR.

(14) $PTOR = (OR - Average\_OR) / (AT\_Board * Average\_OR)$

(15) $d\,(Average\_OR) / dt = Change\ in\ Average\_OR = (OR - Average\_OR) / AT\_Board$

The PTOR determines the amount of external pressure to generate short-term financial results. This is captured by the stock 'External pressure to exploit' (EP) which refers to the level of pressure in a current period. This effect is determined by the lookup variable 'Effect of POR on EP' (see Figure 3). This lookup captures the process that when top management fails to achieve acceptable financial returns, this will result in pressure from the owners on top management to generate short-term financial results (i.e. a pressure to exploit). On the contrary, when the board perceives the financial performance to be adequate, top management will have the possibility to adjust the exploitation-exploration mix as desired (the influence of the EP becomes evident at the 'Attempt to explore' loop).

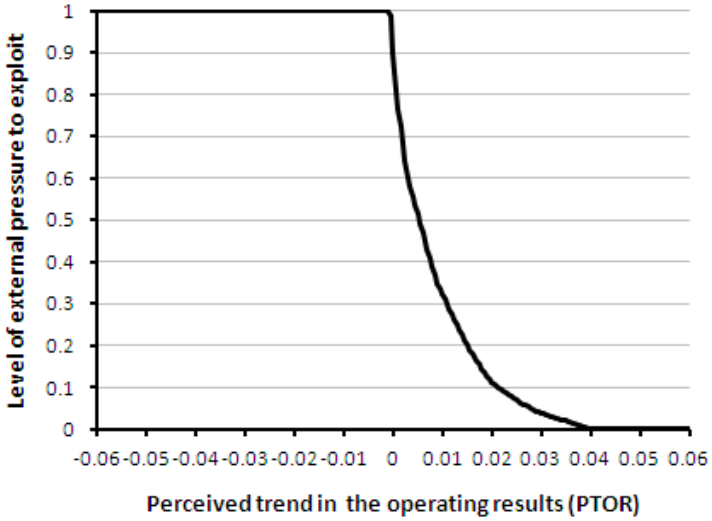


Figure 3: Effect of PTOR on EP

The increase and decrease of external pressure is also subject to a delay, the pressure adjustment time (exogenous constant AT_Pressure). This delay arises from the fact that, first, the Board of Directors operates on the basis of quarterly reports of operating results (reporting delay), and second, the Board acts on the basis of the trend rather than incidental fluctuations in OR. Therefore, the following equation was used for the external pressure to exploit (EP) on top management:

(16) *d (EP) / dt = Change in EP = (Effect of PTOR on EP (PTOR) – EP) / AT_Pressure*

Attempt to explore

The subsequent interaction between the perceived need to explore (PNE) and the external pressure to exploit (EP) determines the value of the variable RIE and reflects top management's behavior (related to the exploitation-exploration balance). This variable can range from 0 to 1 (0 implying a sole investment in exploitation projects while 1 means a mere investment in exploration initiatives). Because this variable depends on both PNE and EP, it is calculated by multiplying top management's desired and the shareholder's allowed investment in exploration activities. The result of this process is the actual investment level in exploration as well as in exploitation which constitutes a key component of the 'Attempt to explore' feedback loop:

(17) *RIE = PNE * (1 - EP)*

2. Model settings and sensitivity

This section presents all the values for the constants after conducting history-replicating simulation based on the obtained data (see the manuscript for more details regarding data collection). This implies that certain constants were 'calibrated' to fit the model variables with corresponding data gathered on site. The results can be seen in Table I where the variables are alphabetically ordered and their set value presented. In this table, a '*' denotes the variables that were taken into the calibration process. In addition, Table II provides an overview of all the variables in the model and Table III gives an overview of all the functions.

As can be seen in Table I, certain variables were not estimated during the history-replicating simulation, but based on reasoning and case study observations. This can be explained by the fact that the firm, from which we gathered our data, did not engage significantly in exploration. As such, it makes no sense to calibrate the delays for exploration. This concerns the variables 'AT_Explore' and 'RD_Explore'. We manually set these variables to two years; in line with the literature that observes the development of radical innovation is likely to take years (e.g. Burgelman et al., 2004). As described in the manuscript, these two variables were subject to a multivariate sensitivity analysis. These variables were given a 5 percent range to vary within (101.4 < 104 weeks < 106.6). The result (of 200 runs) is reported in Figure 4, which demonstrates that the confidence levels only drop somewhat in the last 200 weeks of the total

simulation period. As such, all simulations up to the 95% confidence bounds follow the same trend as the history-replicating simulation. This implies the model is rather robust.

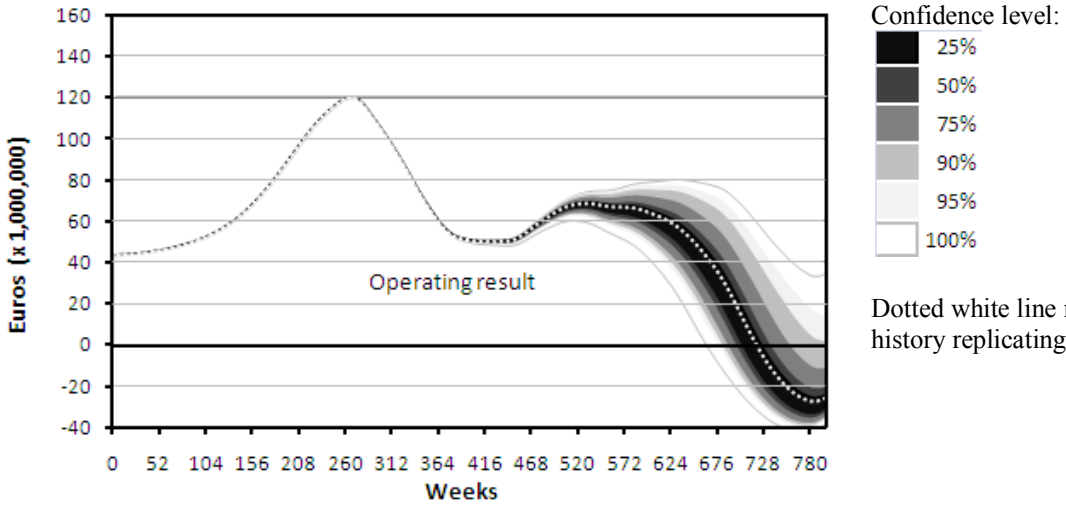


Figure 4: The sensitivity analysis of the manually estimated 'exploration' constants (AT_Explore and RD_Explore)

Other variables not included in the calibration were the adjustment times (delays) that we could estimate by means of case observations and reasoning: 'AT_Management', 'AT_Board', and 'AT_Pressure'. Data related to these variables become (formally) available to the Board of Directors and the executive board every quarter. However, only if a certain trend occurs over a period of two quarters (e.g. negative operating result), the Board of Directors and the executive board are likely to perceive it as a systematic trend. Therefore these variables were set to 26 weeks (six months). Also these three variables, including the AT_Myopia variable, were subjected to a sensitivity analysis. All variables were allowed an 8 percent variation. For AT_Management, AT_Board, and AT_Pressure this resulted in the following range: 24.96 < 26 weeks < 27.04. AT_Myopia had the following range: 438.4 < 456.7 weeks < 474.9). The results (200 simulations) reported in Figure 5 once more indicate good model robustness.

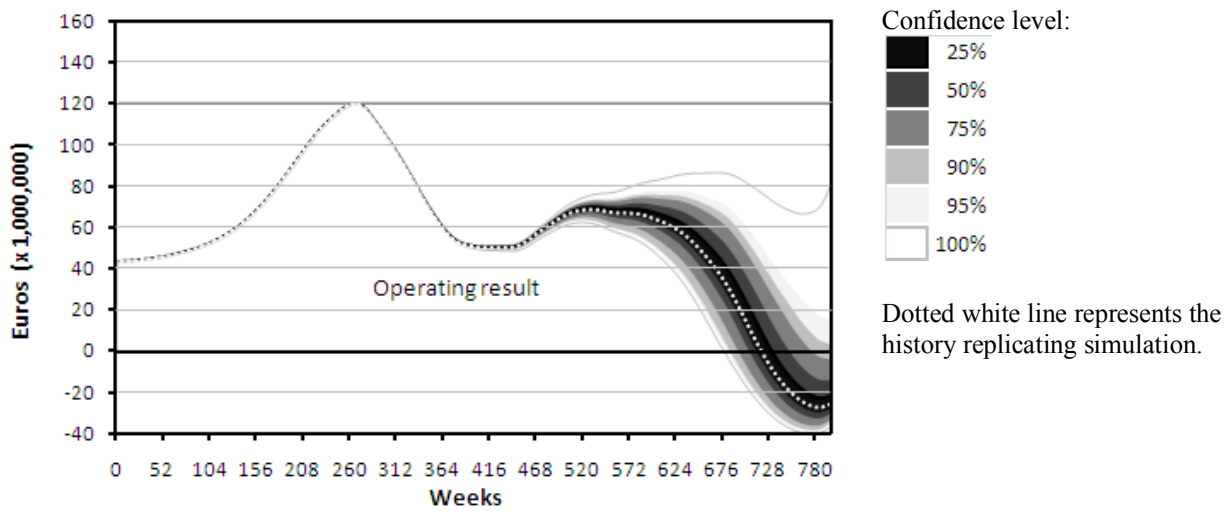
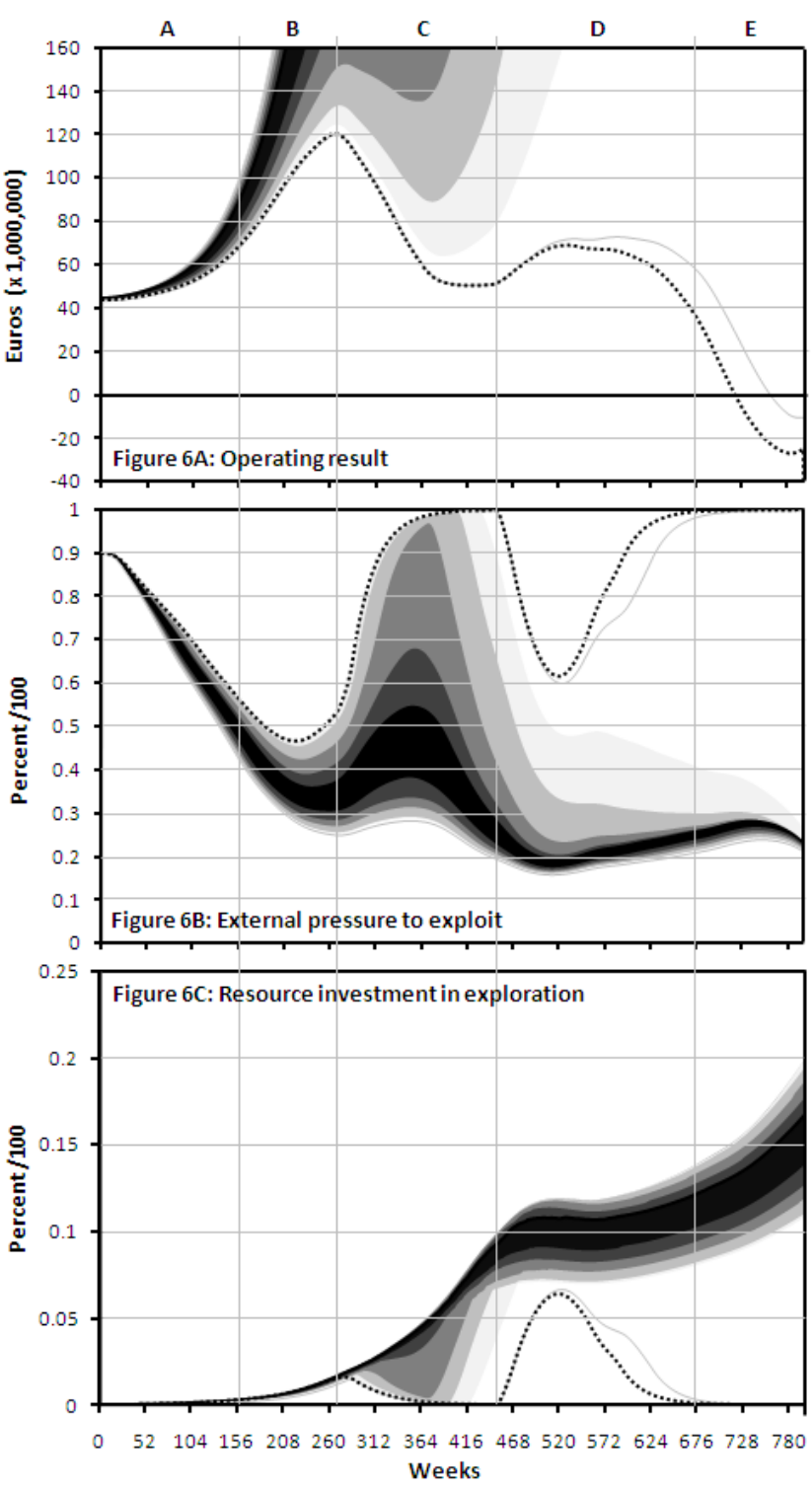
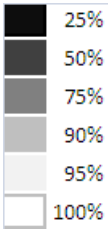


Figure 5: The sensitivity analysis of the manually estimated Adjustment Time constants (AT_Management, AT_Board, AT_Pressure, and AT_Myopia)

The history-divergent simulations were also subject to sensitivity analyses. For this, the exogenous ECD variable was (two times) randomly adjusted over 200 runs. The first set of runs randomly decreased the ECD variable by up to 50%, simulating a decreased level of dynamism and increased level of competitiveness (stable-scenario). The second set of runs randomly increased the ECD variable by up to 50%, simulation an increased level of dynamism and a decreased level of competitiveness (unstable-scenario). Figures 6 and 7 depict the results of the sensitivity analyses of the chosen adjustment in the ECD variable, in the stable respectively unstable scenarios. The results of both exercises further confirm the robustness of the sequences of events described in the manuscript: for the stable-scenario (Figure 6), all 200 simulations end with a notably decreased external pressure (EP), while for the unstable-scenario (Figure 7) all simulation runs result in the success trap. As such, the sensitivity analysis for the stable-scenario underscores the robustness of our finding that when top management is able to cope with the environmental change, a low level of external pressure results and the suppression process (and success trap) is avoided. The sensitivity analysis for the unstable-scenario confirms the robustness of the conclusion that if top management is not able to cope with environmental change, it will trigger the suppression process and eventually lock the firm in the suppression of exploration. (Note that from period D onwards, it is very likely that the firm will need to engage in major reorganizations in order to survive.)

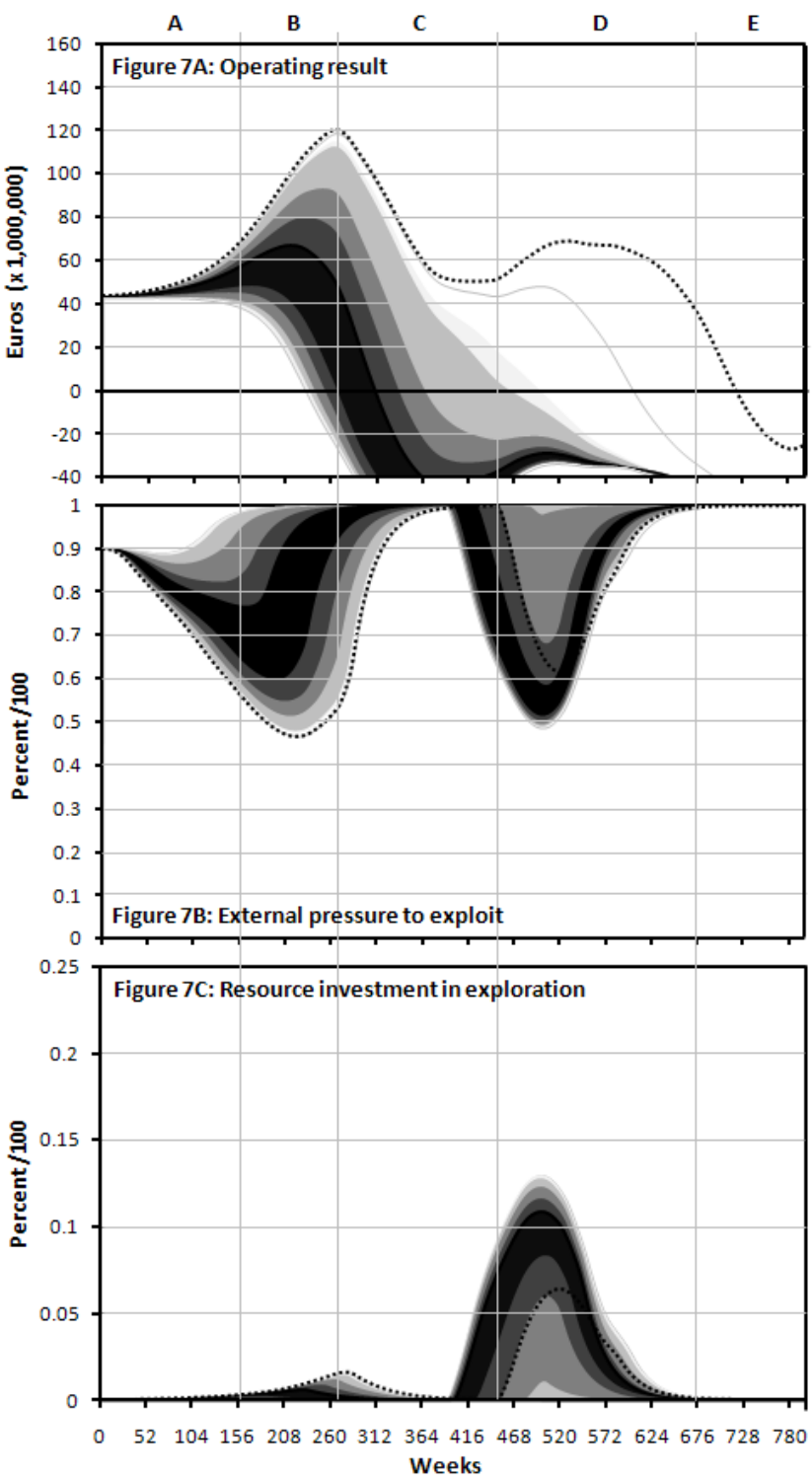


Confidence level:



Dotted black line represents the history replicating simulation.

Figure 6: Sensitivity of the history divergent process theory, stable-scenario.



Confidence level:

- 25%
- 50%
- 75%
- 90%
- 95%
- 100%

Dotted black line represents the history replicating simulation.

Figure 7: Sensitivity of the history divergent process theory, unstable-scenario.

Table I: Overview of all model constants and settings.

Variable name	Setting	Unit	95% CI	Comments/ Explanation of the source of delay
AT_Exploit	37.7085	Weeks	37.6968 - 37.7228	Time necessary to bring about changes in the routines in exploitation activities.
AT_Explore*	104	Weeks	-	Time necessary to create, or bring about changes in, the exploration routines.
AT_Myopia*	456.754	Weeks	449.608 - 465.622	Time necessary to overcome managerial myopia.
AT_Management*	26	Weeks	-	Time necessary to perceive a systematic change in the environmental situation by the executive board.
AT_Board*	26	Weeks	-	Time necessary to perceive a systematic trend by the Board of Directors.
AT_Pressure*	26	Weeks	-	Time necessary to perceive a systematic change in the operating results by the Board of Directors.
Initial Inv_Exploit	1	Million Euros	-	Necessary for starting the simulation. Initial situation implies a mere focus on exploitation, which is in line with the investigated firm.
Initial Inv_Explore	0	Million Euros	-	Necessary for starting the simulation. Initial situation implies a mere focus on exploitation, which is in line with the investigated firm.
MAR	0.5	Million Euros	-	Minimum amount of resources available, even when the operating result is negative. Required to avoid model errors.
OC	81.9477	Million Euros	81.9469 - 81.9486	Operating costs assumed as constant.
POR	0.0236391	Percentage	0.0236385 - 0.0236396	Percent of the operating result that is available for investment in exploitation and exploration.
RD_Exploit	35.5818	Weeks	35.596 - 35.6136	Time necessary to turn investments in exploitation into money-generating products/processes.
RD_Explore*	104	Weeks	-	Time necessary to turn investments in exploration into money-generating products/processes.
RF_Exploit	127.774	Euros	127.775 - 127.776	Factor to differentiate between the results from exploitation and exploration. Lower for the former.
RF_Explore	1312.29	Euros	1301.6 - 1321.02	Factor to differentiate between the results from exploitation and exploration. Higher for the latter.

***** Subject to sensitivity analysis.

Table II: Overview of all model variables.

Variable name	Type	Unit	Comments	Time reference
AR	Auxiliary	Euros	Resources available for both exploration and exploitation initiatives.	Current period
PAE	Auxiliary	Percentage	Perceived alignment with the environment. Can range from 1 (no gap) till 0 (maximum gap).	Current period
EP	Stock	Percentage	External pressure to exploit. Can range from 1 (only invest in exploitation) till 0 (invest in exploitation and/or exploration).	Current period
ED	Exogenous data variable	Percentage	Environmental dynamism (S&P 500 index). Can range from 0 (extremely instable) till 1 (very stable).	Current period
EC	Exogenous data variable	Percentage	Environmental competitiveness (1 - Herfindahl index). Can range from 0 (monopoly) till 1 (extremely competitive)	Current period
ECD	Auxiliary	-	Environmental competitiveness and dynamism. Can range from 0 (implying a sole need for exploitation) till 1 (implying a mere need for exploration)	Current period
Inv_Exploit	Stock	Euros	Sum of Euros invested in Exploitation.	Current period
Inv_Explore	Stock	Euros	Sum of Euros invested in Exploration.	Current period
PNE	Stock	Percentage	Perceived need to explore. Can range from 0 (only invest in exploitation) till 1 (only invest in exploration).	Current period
OR	Auxiliary	Euros	Sum of exploitation-exploration ROI's minus the OC.	Current period
PECD	Stock	-	Perceived environmental competitiveness and dynamism. Can range from 0 (very stable) till 1 (extremely instable).	Current period
PTOR	Auxiliary	Euros	Average fractional growth rate of OR.	Current period
RI_Exploit	Auxiliary	Percentage	Percentage of total invested Euros in exploitation compared to the sum of exploitation and exploration. Can range from 0 till 1.	Current period
RIE	Auxiliary	Percentage	Result of the interaction between management (PNE) and the Board of Directors (EP). Can range from 0 (only invest in exploitation) till 1 (only invest in exploration).	Current period
ROI_Exploit	Stock	Percentage	Return on investment exploitation (considering RF_Exploit and RD_Exploit).	Current period
ROI_Explore	Stock	Percentage	Return on investment exploration (considering RF_Explore and RD_Explore).	Current period

Table III: Overview of all functions.

Variable name	Function
AR	MAX (OR * POR, MAR)
PAE	(1 – RI Exploit) * PECD
Change in EP	d (EP) / dt = Change in EP = (Effect of PTOR on PE (PTOR) – EP) / AT_Pressure
ED (for period *t*)	The picture can't be displayed.
EC (for period *t*)	$1 - \sum_{i=1}^{N} s_i^2$
ECD (ω = 2/3)	ω * Effect ED on ECD (ED) + (1- ω) * Effect EC on ECD (EC)
Change in Inv_Exploit	d (Inv_Exploit) / dt = ((1 - RIE) * AR – Inv_Exploit) / AT_Exploit
Change in Inv_Explore	d (Inv_Explore) / dt = (RIE * AR – Inv_Explore) / AT_Explore
Change in PNE	d (PNE) / dt = (1 – PAE – PNE) / AT_Myopia
OR	ROI Exploit + ROI_Explore – OC
Change in PECD	d (PECD) / dt = (ECD – PECD) / AT_Management
PTOR (trend)	(OR – Average_OR) / (AT_Board * Average_OR) d (Average_OR) / dt = Change in Average_OR = (OR – Average_OR) / AT_Board
RI_Exploit	Inv_Exploit / (Inv_Exploit + Inv_Explore)
RIE	PNE * (1 - EP)
Change in ROI_Exploit	d (ROI_Exploit) / dt = (Inv_Exploit * (1 – ECD) * RF_Exploit – ROI_Exploit) / RD_Exploit
Change in ROI_Explore	d (ROI_Explore) / dt = (Inv_Explore * ECD * RF_Explore – ROI_Explore) / RD_Explore

3. Deterministic versus stochastic

An important characteristic of exploration projects is their uncertain nature. That is, employing a deterministic model, as described in the manuscript, might seem to bias the results (e.g. ROI_Explore). Therefore, the effect of a stochastic return on exploration investment (ROI_Explore) was investigated. In order to do so, a *Pink Noise* (PN) structure was adopted and its outcome multiplied with the ROI_Explore variable.

Change in ROI_Explore (stochastic):

(18) *d (ROI_Explore) / dt = (Inv_Explore * ECD * PN) / RD_Explore*

PN is formed by first-order exponential smoothing of *White Noise* (WN) and is often referred to as *first-order autocorrelated noise* (Sterman, 2000). The main difference between the two is that the

former has a 'memory', and, therefore, the output of $t + 1$ is not independent from t. For example, if at a certain t, the investment in exploration initiates is not as profitable as desired (e.g. 90 percent), it is unlikely that at $t + 1$ the package projects will generate above expected returns (e.g. 110 percent). As such, PN provides a more realistic noise process than white noise. The following formulas were used to generate PN (CT equals correlation time). See Sterman (2000) for more details concerning (pink) noise generation.

Change in PN:

(19) $d\,(PN) / dt = (WN - PN) / CT$

(20) $WN = Mean + SD * ((24 * CT/dt)^{0.5}) * UNIFORM(-0.5, 0.5, Noise\ Seed)$

Following the argumentation in the main text we assume that, effectively, failures will be counteracted by successes. Therefore, the mean value was set to 1. The SD was set to 0.3, giving the PN variable a likely range from about 0.95 till 1.05 and a possible range from slightly less than 0.9 and somewhat more than 1.1 (see Figure 8). The overall result of the PN process is depicted in Figure 3 which illustrates the different confidence interval levels for this variable (based on 200 simulation runs). Figure 9 and 10 illustrate the behavior of the EP and OR variables in this stochastic model. The influence of PN on the ROI_Explore variable can be seen in Figure 11.The results of the stochastic model (captured by the confidence interval levels) can now be compared with the deterministic model (denoted by the doted white lines). We concluded that the stochastic process (PN) does not alter the results of this study in a noteworthy manner. As such, the model was kept deterministic, for reasons of readability.

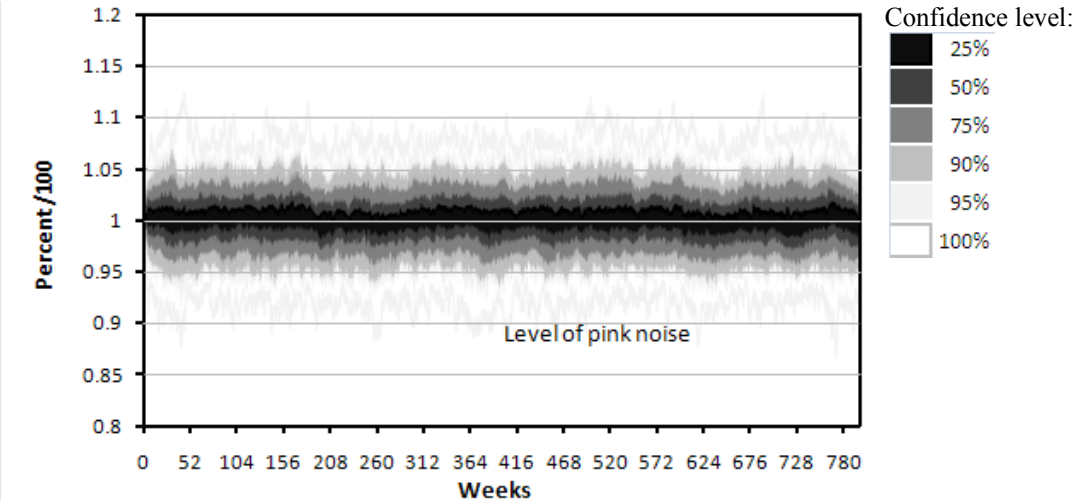


Figure 8: Confidence interval levels for the Pink Noise (PN) variable.

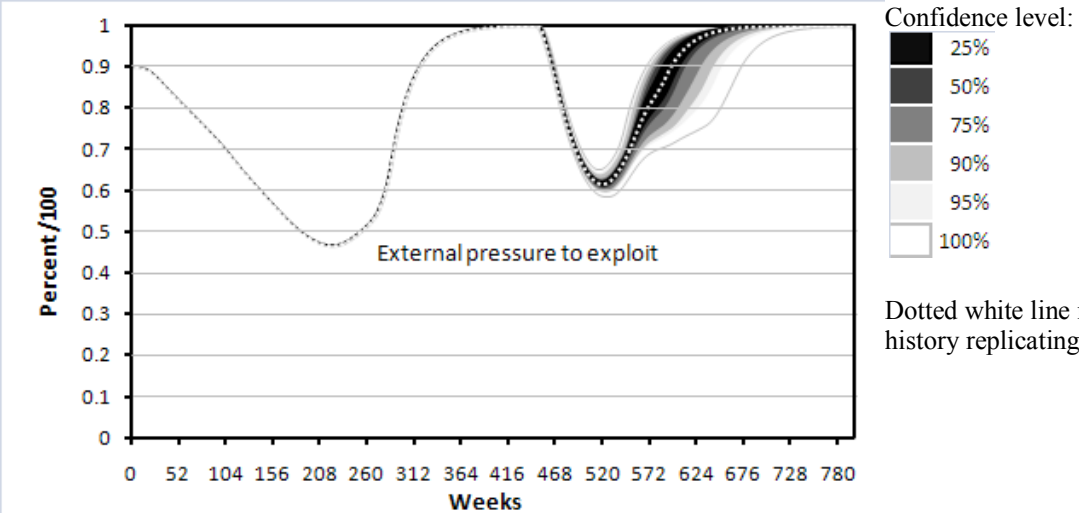


Figure 9: Confidence interval levels for the ROI_Explore variable (stochastic model).

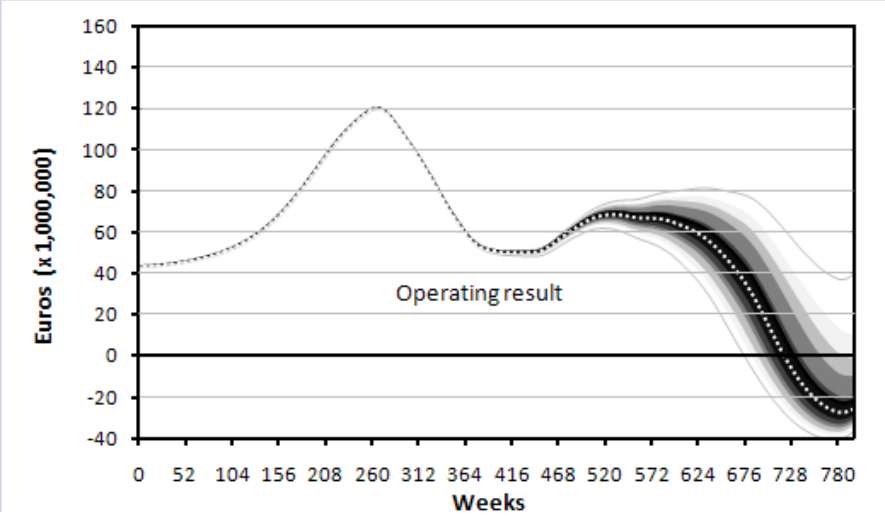


Figure 10: Confidence interval levels for the OR variable (stochastic model).

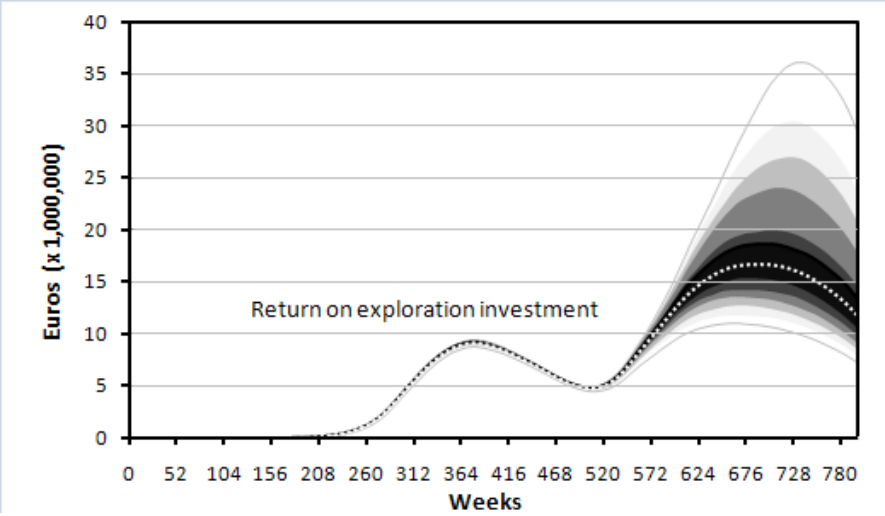


Figure 11: Confidence interval levels for the EP variable (stochastic model).

4. References

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