Private-Public Cycle: Testing Hirschman's Theory of Shifting Involvements with a Formal Model

(in alphabetic order)

Cécile Emery

Min Liu

University of Italian Switzerland

Via Giuseppe Buffi 13

CH-6904 Lugano

Switzerland

University Phone: + 41 (0)58 666 4243

Cécile Emery Phone: + 41 (0)76 448 73 63

Min Liu Phone: + 41 (0)77 430 60 09

cecile.emery@lu.unisi.ch

min.liu@lu.unisi.ch

Abstract

_____

Why do societies oscillate, on a roughly twenty-year cycle, between modes of private acquisitiveness and public spiritedness? Albert O. Hirschman argues that disappointment is the main cause explaining why societies never stop shifting from an ideology promoting private interests to another philosophy which endorses public action and vice versa. The aims of this paper are to reconstruct Hirschman's reasoning using a System Dynamics approach and to build a simulation model reproducing the oscillations societies experiment between private and public interests. Our simulation results reproduce the behaviour implied by Hirschman, therefore showing evidence of the dynamic consistency of his argumentation. Furthermore, an example taken for a novel and empirical data, which represents the evolution of turn-out in the US, have been used to gain deeper support of our findings. Further research using this model is promising.

_____

Key Words: Disappointment, Private Interest, Public Interest, Second Order Model

"Hope is itself a species of happiness (…) but, like all other pleasures immoderately enjoyed, the excesses of hope must be expiated by pain. Expectations improperly indulged must end in disappointment." - *Samuel Johnson*

"Expectation is the root of all heartache." - *William Shakespeare*

Introduction

Many philosophers across ages, cultures, and language have reached the same conclusion that humans are eternal unsatisfied beings. Whatever the satisfaction currently experienced, people tend to believe that higher satisfaction can be increased by acquiring new goods, by conquering someone, or by subscribing to new ideologies. If the previous actions are successful, hopes and expectations are fulfilled, which provides satisfaction. However, in their perpetual quest for happiness, people forget that desires usually do not correspond to reality. Unable to reach their dreams, people experience a strong feeling of dissatisfaction. As Friedrich Nietzsche noticed "hope in reality is the worst of all evils, because it prolongs the torments of man." The feeling of disillusionment is not out of consequences. Therefore, the important role played by disappointment has been increasingly highlighted and studied during the last decades from a variety of disciplines.

Philosophy and psychology were the first fields to do so (Craib 1994; Freud recurrently stated that hallucinatory satisfaction would be followed by "disappointment"). Disappointment has been particularly studied in marketing research since consumers' dissatisfaction can generate

severe costs for companies (Farley et al. 1975; Jia et al. 1997, van Dijk 1999). Recently, behavioural economists have also recognised the importance of disappointment in decision making. Following David E. Bell's theory on disappointment (1984), many models have been constructed to understand the effects of such feeling on risky choice behaviour (Jia et al. 2001; Loomes & Sudgen 1986) and on decision making (Zeelenberg et al. 2000). Albert O. Hirschman (1982) analyses the issue of disappointment at higher level by stating that disappointment is a central element not only of human experience but also of societies' evolution. According to Hirschman, disappointment is responsible for the shifting in involvements between opposite ideologies: private versus public interests. The first ideology states that happiness can be pursued by the stimulation of private interests, while the second endorses public action as a way to do so. Here is a simple and general illustration of his thoughts. Societies ruled by one ideology will build expectations. If reality does not correspond to desires, disappointment rises. As disappointment accumulates, faith in the ideology decreases while, parallelly, preference for the opposite one starts increasing. Once the relative preference for the new ideology over the earlier is high, societies shift and start adhere to the principles dictated by the recently implemented ideology. As it was the case before, societies sooner or later will experience disappointment and shift to the original ideology and the story will restart.

Hirschman's work on disappointment and shifting in societies' involvements is particularly intriguing when analysed from a System Dynamics perspective. Indeed, his book "Shifting Involvements – Private Interest and Public Action" provides not only clear reference modes, by describing oscillations between periods of intense preoccupation with public issues and of almost total concentration on individual improvements, but also precise and complete mechanisms which explain the shifting in involvements performed by societies. Hirschman's entire argumentation can therefore be easily reinterpreted in terms of feedbacks, delays and behaviours over time. For that reason, the aims of this paper are to reconstruct Hirschman's reasoning using a System Dynamics formulation and to construct a simulation model reproducing the oscillations in societies' involvements. The process of summarizing and modelling written theories is delicate and requires careful considerations from the researchers. However, second order models, i.e. models of theories (Wittenberg 1992, Larsen and Lomi 2002), have the potential to illustrate and to complete existing theories by discovering new insights. Here, by making explicit and by modelling the main feedback processes implicitly enumerated within the lines of the book, our goal is to prove the dynamic consistency of the author's argumentation. Further research on the potential explorations of the model are currently taking place but will only be briefly mentioned at the end of this paper.

Validation of our model is carried out in two steps. The first step is accomplished on a "link-by-link" basis (Larsen and Lomi 2002), through examining the formal and substantial comparability between Hirschman's theory and our model formulation. The sections of Hirschman's arguments and of the causal loop diagram together realize this first validation approach. The second step of model validation is conducted with the help of a behaviour reproduction test (Sterman 2000), which is illustrated in the section of simulation results.

We organize our arguments in the following way. The entire system takes into account two ideologies between which societies oscillate: the private and public. Each ideology consists of indefinitely repeated cycles characterised by emergence, growth and decline of ideas. The paper will start by presenting the general mechanism implied in the private cycle as well as a summary of Hirschman's justifications of such feedback mechanisms. The same will be done

concerning the public cycle. To highlight the main feedback effects involved in societies' shifting in involvements between private interest and public action, the argumentation will be translated in form of a causal loop diagram. An example, taken from the novel "Gone with the wind", illustrating societies' shifting will then be provided. After presenting justifications concerning our approach, simulation results will be presented as well as empirical evidence which supports our findings. A discussion concerning contributions of our results and future research will conclude our paper.

Understanding Hirschman's Argumentation

Are societies predisposed toward oscillations between periods of intense preoccupation with public issues and of almost total concentration of individual improvement and private welfare goals (Hirschman 1982, p.3)? Restated, which are the dynamism driving the shifting in involvements from private interest to public involvement and vice-versa? To answer these questions, comprehending the characteristics and dynamisms involved in private interest and public involvement separately is first required. In the following section, explanations of the underlying mechanisms involved in the private interest and public action will be described separately. The aim is to provide the reader with a complete overview of Hirschman's argumentation.

Dynamism Regulating Private Interest

Societies have always been driven by ideologies, i.e. sets of believes which offer change through a normative thought process. Over the past centuries, an ideology enhancing and protecting private interests, welfare as well as consumption has repeatedly ruled societies for significant periods of time. Such ideology is referred to as "consumerism" and states that personal happiness can only be reached through consumption and acquisition of goods: the more one possesses, the more needs are fulfiled, and so happiness spreads from satisfying one's needs. As believes in consumerism get stronger, citizens, driven by the idea that the pursue of happiness is achieved toward consumption, increase their acquisition of goods. The boom in consumption implies two elements. First, buying new goods creates, at least in the short term, satisfaction: the perceived satisfaction created by the act of consumption rises. Parallelly, people's expectations tend also to inflate: consumers anticipate to receive a higher level of satisfaction when increasing their expenditures as promised by the consumerists. If desires correspond to reality, then consumers are satisfied and continue believing and adopting the consumerism ideology. However, Hirschman notes that the previous is rarely the case. Indeed, because desires usually exceed reality, the failure to fulfil one's hopes therefore creates a feeling of disappointment. The mechanisms described above being general, it is interesting and necessary to go deeper into the analysis of disappointment.

Where does disappointment actually come from? To answer the previous, it is usufull to restate the question and ask where *satisfaction* comes from. Concerning private interests, satisfaction does not rise from consumption itself: it actually emerges from the *pleasure* generated by the act of consumption. An important distinction must be introduced between pleasure and comfort: "pleasure is the experience of travelling from discomfort to comfort and is experienced only when the good is first acquired and used, while comfort is achieved at the point of arrival" (Hirschman 1982, p.27). The discrepancy mentioned above between expected and actual satisfaction can therefore be restated in term of "disbalance between pleasure and comfort" (Hirschman 1982, p.33): the higher the difference between desired and

actual pleasures, the higher the disappointment. When societies believe in consumerims, disappointment arises from three types of consumptions. Each potential source of disapointment will now be discussed.

Non-Durable Goods Hischman makes a key distinction between nondurable and durables goods since, according to him, they generate different level of disappointment. Nondurable goods, i.e. goods that are entirely destroyed during consumption, are considered to be "both pleasure-intense and disappointment-resistant" (Hirschman 1982, p.29). The pleasure generated by their consumption is not only important but also repetited over time. Take the simple example of food. Who did not experience the high and intense pleasure eating provides when one is really hungry? Who do not appreciate eating fine and rafined food? Don't people use the expression "pleasures of the table"? Of course, non-durables are not disappointment-exempted: simply imagine the stomach aches resulting from the over consumption of a particular product. Other examples can be a pleasure trip, a ticket to an opera or a stadium.

Durable Goods On the other hand, durable goods, which are promoted through mass-consumption and constitute the core of modern consumption culture (television, cars, waching machines, dry cleaners etc), have their pleasure-comfort balance tilts in favour of the latter. The previous does not imply that durables do not generate pleasure at all. Pleasure is experienced when the durable good is acquired and used for the first time. However, once the utilisation becomes common and repetitive, comfort is assumed, apleasure is not longer experienced, and disappointment emerges. People "fault durables precisely for being all comfort and hardly any pleasure, in sharp contrast to more traditional purchases of nondurables" (Hirschman 1982, p.33). Take the example of the private automobile. The excitement and pleasure experienced when first driving it will disappear at a certain point. The car will then be perceived as a motion instrument. It should be noticed that Hirschman clusters durables in different categories to which correspond different level of disappointment. Such details will not be discussed here as the main point is to show that durables generate higher disappointment than non-durable goods.

Services Services, a major sector which continues expanding nowadays in modern societies, also have the potential to disappoint consumers. However, the reasons for being disappointed with services are quite different compared to durables. In the former case, disappointment "arises out of a large number of cases in which there is partial or total failure to achieve the purpose for which the services are acquired" (Hirschman 1982, p.44). A good illustration are medical services. People except their doctor to cure them successfully in one session. However, it is usually not the case that medical profession can instaneously, or even in the long term, heal injuries or diseases. Since the quality of services is defined only when the service is performed, the potential dissatisfaction is significantly high.

At this point, it should be clear that disappointment from private interest is caused endogenously since the disappointing potential is embedded in the characteristics of durable goods and services, which endogenously play an increasingly important role in our life with the development of our societies toward the modern and wealthier direction.

To sum up, when periods promoting private interests and welfare occurs, individuals, who increase significantly their proportion of durables acquiered, will experience and accumulate disappointment which spread from a higher consumption of durable goods and services. Accumulated dissatisfaction over time has crucial, but usually underestimated, consequences.

Indeed, on their perpertual quest of happiness, disappointed individuals will learn from past experience, adjust their behaviour, evolve and allocate significant amount of time and energy in finding new products, or ultimately ideologies, in order to become satisfied again. In this sense, disappointment is said to be "a central element of human experience" (Hirschman 1982, p.11).

Hirschman pushes the reasoning one step further by believing that disappointment rules not only individual lives but also entire societies. According to him, when societies are enhanced by consumerism, a strong feeling of disappointment, instead of the promised happiness, will be felt by the entire society. As the accumulation of disappointment rises, people start not only questioning believes in consumerism but also reacting in two different ways to such situation. They can *exit* the consumerism and embrace a dichotomous ideology which states that the pursuit of happiness relies on the decumulation of belongings and on the stimulation of public action (P.63). Consumers can also "rise their *voices* and engage into actions, which range from private complaining to public action in general interest" (P. 64), to force companies to modify the pleasure-comfort balance included in their products. As a result of exit and voice reactions, societies, losing faith in the ideology that previous dictated their conduct, decrease their preference for private interests while developing interest in another ideology promoting that the increase of one's actions toward society is a way to pursue happiness. The latter philosophy is referred to as "public involvement". Once the relative preference of private interest over public involvement becomes significant enough, societies evolve and adhere to the public involvement ideology. After this shift as been operated, people, focusing on the potential satisfaction produced by their involvement in politics or communities, reduce their private consumption as well as their expected satisfaction, which slowly reduces their disappointment in private consumption.

Adding the Public Interest

As explained in the previous part, durable goods and services with high disappointing potential increasingly occupy the modern societies and therefore cause disappointment in private consumption. In contrast to consumrists' idea that happiness is achieved through stimulating private interests, Hirschman predicts that periods of "high mass consumption" will bring disappointment which is ultimately responsible for changing societies' ideology. In their quest of eternal satisfaction, disappointed societies shift and adopt an ideology encouraging public action.

This section will add the other part of the story dealing with the disappointments in public involvements resulting from the institutional features of modern societies (see Figure 2). Disappointed by their experiences in the private consumption, citizens are propelled into the public arena and involve more in public actions. However, "life in the public arena has a number of disappointments of its own" (Hirschman 1982, p. 92). Gap between expected and perceived satisfaction for people involved in public activities will be endogenously generated by at least four reasons: unsatisfying outcome, overcommitment, underinvolvement and disillusion.

Unsatisfying outcome Unsatisfying outcome originates from the poverty of human's imagination, which produces disappointment. It is easy to understand that unsuccessful attempts in public action will end in disappointment and thus a withdrawal from public life (e.g. frustrated from an unsuccessful revolutionary attempt). However, in the majority of

cases, the outcome of public action can be said as neither successful nor failed since the expected result of the public action is a product of people's own imagination. Even worse, human beings have a general "propensity to conjure up radical change" in the society and are therefore not able to "visualize intermediate outcomes and halfway house" (Hirschman 1982, p.95). Thus, people's expected satisfaction will systematically exceed their perceived satisfaction from public involvements and create in a gap between the high expectation and the modest reality.

It is worth noting that the "unsatisfying outcome" does not lead necessarily to disappointment. Dissatisfaction in public action can result either in disappointment or encouragement (because of unfinished business). In other words, "dissatisfaction is not in itself a reason why one would necessarily expect a turning away from (public) actions" (Hirschman 1982, p. 95). The next three types of gap will deal with more fundamental reasons why people get disappointed, decrease their preference for public actions and finally withdrawal from the public life.

Overcommitment Overcommitment results from the fact that, again based on the poverty of our imagination, people often underestimate the time needed for public affairs. This leads to a common experience for many people, that the public action requires much more time than they originally expected. A permanent overrun of actual time needed on public activity over the time people initially budgeted for it can be an important reason for disappointment because the duration of an activity plays an important role for the pleasure perceived from that activity. Hirschman explains this point with the example of extremely slow service in restaurants. No matter how good the food is, if the waiting time between courses overruns significantly what one has initially awaited, the pleasure seems to be reduced remarkably.

Besides underestimation of time required for public actions, the second reason for overcommitment is that the public movement often takes a life of its own and people loss control on it and thus need much more time to correct it. There exists an "asymmetry between private and public life". People can devote themselves entirely to private life and totally rule out the public activities. However, it is only occasionally possible or even not possible at all for people to completely concentrate on public issues. Therefore, it is not hard to imagine that the systematic excess of actually required over initially planned time for public involvements can be felt as very costly from some point of time (e.g. the rising opportunity cost of public activity), cause disappointment in the public life and finally a turning away from the "practice of citizenship" (Hirschman 1982, p. 97).

Underinvolvement To deal with the time scarcity and the overcommitment problem, our modern society has invented the voting system so that all the citizens can participate in major political decisions (mass participation) by spending only a very limited fraction of time in public affairs (limited time requirement). However, Hirschman convincingly states that this does not prevent the rising of disappointment in public life. As will be shown in the following text, another type of gap between expected satisfaction and actual satisfaction is embedded endogenously in the institution of the modern democracy and can cause underinvolvement and thus citizens' frustration and disappointment in public life. (Hirschman 1982, p. 103).

In private consumption, there is a clear distinction between the activities of producing income in order to be able to consume and the enjoyment of the pleasure out of private consumption. For public activities, on the contrary, there is not such a clear distinction between the striving of pleasure from public life and the attainment of it. In fact, the process and the activities

public participation are themselves highly pleasurable and thus at least as important as the result of the collective public movements (e.g. the realization of some revolutionary objectives). (Hirschman 1982, p. 85)

In other words, the pleasure one can get from the public involvement is the sum of the pleasure one enjoys from his (or her) participating activities and the pleasure resulted from the outcome of the public action. However, the attainment and the result of the public actions is a public good and available to everyone (Hirschman 1982, p.104), which leaves the pleasure during the striving process in the public action being the only private enjoyment. Therefore, people can only enhance their own benefits in public life through increasing their own inputs.

The central body of the mass democracy in our society is the voting system with the "one man one vote" principle. This institution, on one hand, grants every citizen a minimum share in public decision-making; on the other hand, it sets some kinds of maximum. However, this maximum or ceiling hinders people from stepping up their inputs and thus limit their pleasure and satisfaction out of the participation in public activities. This gap between the satisfaction people would like to achieve through their participation in public affairs and the satisfaction their actually enjoy based on the voting system in the modern democracy can result in frustration and disappointment and even a withdrawal from the public life. The general political apathy in many democratic societies proves this argument.

Disillusion Disillusion is caused by the gap between the expected and the actually experienced quality of the public experiences. At the end of last session from private consumption to public action, public action is conducted by people as an alternative to the emptiness, the narrowness and the disappointments in the purely private life. However, it is well known that the practice in public life is far from idealism as people imagine (again the poverty of our imagination). Alliances, making compromise on the cost of one's initial idealistic objective, violating one's ethical code and even betray of comrades are necessary in order to reach the "goal" for the sake of the "Cause". The gap between people's expected idealistic quality and the actually experienced quality in public life is another source of disappointment and an exit from public involvements.

There is one remark worth making here. Disillusion can lead to either withdrawal, as stated before, or addiction. Some people will be addicted for the whole life; others will become against public activities because they are aware of their addiction and want to get rid of it.

To sum up, regardless the causes, all the four reasons stated in the previous text justify the "gap of satisfaction of public involvements" in Figure 2. Whereas dissatisfying outcome concentrates on outcome of the public actions, the other three reasons (overcommitment, underinvolvement and disillusion) focus on the nature of the public activities (Hirschman 1982, p.96) and reveal the fundamental reasons for "disappointment from public involvements", which result in people's decreasing preference for public life and finally their withdrawal from public actions.

Different groups of the modern democratic society gather opposite experiences through their public involvement, both, however, result in disappointment. The one group who use voting as their only way of public involvement feel that the "one man, one vote" principle prevents them from fully expressing their intensive feeling and thus suffer from underinvolvement and the disappointment of this kind. The other more active group with the capability of

participating actively in the public decision making experiences the systematic excess of time actually required over the initially planed time for public activities and therefore suffers from overcommitment. In other words, "participation in public life offers only this unsatisfactory too-much-or-too-little choice and is therefore bound to be disappointing in one way or another" (Hirschman 1982, p. 120).

Even if people could sustain the disappointment resulted from overcommitment or underinvolvement and still keep their passion for public involvement, they may then experience the gap between the expected and the actually experienced quality of the public experience and thus get disappointed.

Now we are only one step away from the starting point of our voyage. Disappointed by the public life, the citizens decrease their preference for public activities and increase their preference for private consumption. In other words, they return to "normalcy" and strive again for private happiness. The next cycle from private to public and again from public back to private begins.

Causal Loops Diagram of the Argumentation

The previous section described the mechanisms which, according to Hirschman, cause societies' shifting involvements between private and public interests. To test the dynamic consistency of Hirschman's theory, the next logical step consists in identifying the main feedback processes involved in such a system. In other words, Hirschman's argumentation will now be transformed into a causal loop diagram. The goal of this section is also to validate our model on a "link-by-link" basis (Larsen and Lomi 2002) by showing that our model formulation is in accordance with Hirschman's theory illustrated in the previous section. The construction of the causal loop diagram follows the same reasoning as the argumentation. The private interest cycle will be first modeled, and then the public interest will be added to finish with a complete representation of the system.

Speaking in general terms, the mechanisms regulating the private interest cycle can be summarized as follows. When societies adhere to consumerism, people, believing that new acquisitions will increase their happiness, increase their private consumption. The acquisition of new goods inflates not only people's perceived satisfaction but also consumers' expectations. As extensively discussed above, desires always exceed reality and so a gap between expected and perceived satisfaction rises. The higher the gap of satisfaction, the higher the disappointment experienced by consumers. As disappointment accumulates over time, the preference for private consumption decreases. As believes in the consumerism are weaken, an alternative ideology, public action, gains interest and becomes increasingly more attractive compared to private interest. Finally, as the relative preference of private over public interest gets smaller, consumers, now believing that public action will increase their happiness, slowly reduce their consumption.

The loop described above is balancing under the assumption that expected satisfaction always exceed perceived satisfaction and so that the gap in satisfaction leads to disappointment. The characteristics of the loop generate oscillation between periods of high and low interest in private consumption. The private interest cycle can therefore be represented by the next causal loop diagram (Figure 1).
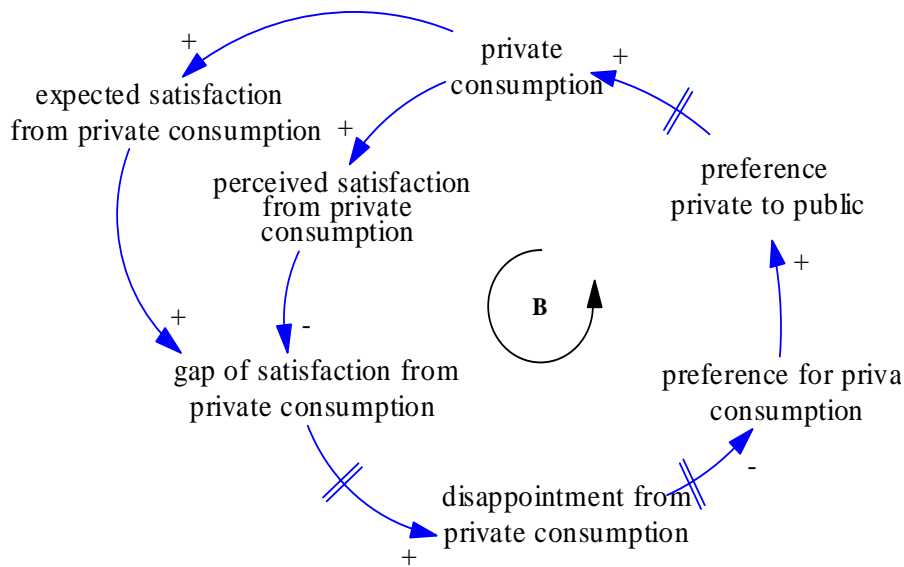
Figure 1: Causal Loop Diagram – Private Interest

The cycle characterising public action is exactly the same as the private interest cycle. By increasing their public involvement, people's perceived satisfaction and expectations rise. As stated before, unsatisfying outcomes, over commitment, under involvement, and disillusions will, sooner or later, create a gap between the expected and perceived satisfactions generated by public actions. Disappointment follows the apparition of such gap. As disappointment cumulates, the preference for public involvement decreases and private interest becomes more attractive. Finally, as the relative preference of private over public interest increases, societies slowly shift back to an ideology promoting private welfare and reduce their involvements in public issues.

Like the private interest cycle, this loop is also balancing when assuming that expectations must be higher than reality in order to create a feeling of disappointment. It is characterised by periods of intense participation in public live followed by periods of disinvolvement.

Put together, both cycles form the complete system representing societies' shifting in involvements as shown in Figure 2. The system is therefore composed of two symmetric loops connected by one by variable, "preference private to public", which is responsible for the shifting from one ideology to the other. It is important to notice that delays regulate the behavior of the system. Indeed, societies do not evolve extremely quickly.
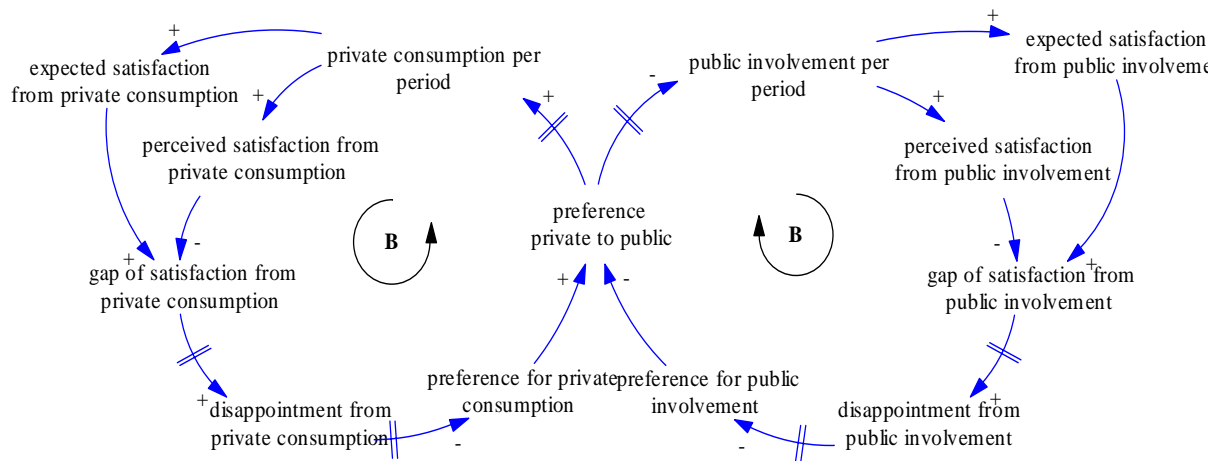
Figure 2: Causal Loop Diagram- Private Consumption and Public Interest

Now that Hirschman's argumentation has been summarized and interpreted in terms of feedback loops, an illustration taken from a novel will illustrate how societies evolve between private and public interest.

Illustration with the story in "Gone with the Wind"

The well known novel "Gone with the Wind" (Margaret Mitchell 1936) offers a lively description of the transformation of the society of the cotton-rich South of the USA from the private happiness to public involvement and again back to the striving for private interest through the American civil war.

Being bored from the peaceful and prosperous life backed by the wealth built on the cotton richness, the middle and upper classes in the South part of the USA feel the war as a welcome alternation. The poverty of their imagination lets a glorious picture of war emerging in their mind- "riding a pretty horse and having the girls throw flowers at you and coming home as a hero" (Margaret Mitchell 1936, chapter 6). Old generations who once experienced the disappointment from the last cycle of public involvements (the Seminole war and the Mexican war) tried to warn the majority against their enthusiasm to the total public involvement. However, these disappointing experiences made by the older generations "was a reminder of a cruder era… an era everyone would like to forget" (Margaret Mitchell 1936, chapter 6). Blended by this ripping version of war and the feeling of being a part of a "Cause", the major topics on various parties changed from "cotton, slaves and tobacco" to how they could "leak the Yankees thieves in a month" in coming war (Margaret Mitchell 1936, chapter 6).

However, during the four-year war time, people of both North and South part of the USA experience disappointment originated from overcommitment (Both the actual monetary and temporal cost overrun far more than the people initially were willing to sacrifice for the "Cause") and from the quality gap (instead of the glorious version of war, most of them experience "hungry.. getting the measles and pneumonia from sleeping in the wet" (Margaret Mitchell 1936, chapter 6). For the Cotton Kingdom (the South), even worse, at the end of the

civil war, a last disappointment was waiting for them- the gap between the expected and the actual outcome. "It was all over, the bright beautiful dream they had loved and hoped for, the Cause which had taken their friends, lovers, husbands and beggared their families. The Cause they had thought could be never fall had fallen forever" (Margaret Mitchell 1936, chapter 29).

Being disappointed by their experiences in public involvement (war is doubtless one of the most intensive types of public participation), people return to pursuit of private interest after the ending of the war. "…they were caring about life again, caring with the same urgency and the same violence that animated them before the war had cut their lives into two." (Margaret Mitchell 1936, chapter 38) For example, the only thought Scarlett was having in her mind after knowing the news of the surrender is "we'll plant more cottons, lots more… Good lord! Cotton ought to go sky high this fall!" (Margaret Mitchell 1936, chapter 29)

Why Simulation

As we have mentioned at the beginning of this paper, the model we build in this paper is a "second-order model", which is not a model of a historically determined process like the majority of existing system dynamics models, but a model of a theoretical narrative. (Larsen and Lomi 2002). Second order models have the potential of testing and completing existing theories as well as shedding new light on the dynamic processes standing behind the theories. However, this potential remains largely unexplored. Only a few examples are available. Sterman made the try of using a second order model to test the dynamic consistency of Kuhn's theory of scientific revolution (Sterman 1985), Wittenberg then joined the discussion together with other system dynamists (Wittenberg 1992, Radzicki 1992, Sterman 1992, Barlas 1992, Sterman and Wittenberg 1999). Sastry's paper of formalizing and testing the conventional theory of punctuated organizational change by Tushman and Romanelli (Sastry 1997) represents another attempt in this area, followed by Larsen and Lomi's (1999, 2002) model of representing organizational inertia. A few other scholars like Hanneman et al (1995), Masuch (1985) and Hall (1976) also contributed to this field of research.

We are using a second-order model of system dynamics approach in this paper for testing a theory of social processes mainly because this methodology offers advantages in: (i) formalizing theoretical concepts, which are originally described in natural language, within more articulated theoretical framework in order to test the dynamic consistency of the theory, without weakening the comprehensiveness and the ambiguity of social theories. (ii) providing an alternative way of testing social theories in a simultaneous and complex system, comparing to the traditional and unconvincing way of examining a series of sequential single-proposition statements about complex and interdependent social processes. (iii) scanning possible ramifications of alternative ways in which propositions might be connected (Larsen and Lomi 1999).

Formalization of the Model

The model is divided into two macro-sectors that represent the private consumption and the public involvements (see Figure 3). It must be noticed that Figure 3 is NOT the complete stock and flow diagram, but a diagram showing the main links in the model. The complete model is attached as appendix.

As it can be seen in Figure 3, the two sectors are linked through the variable *relative disappointment* (RD), which is calculated as a proportion of *disappointment from public involvements* (PUD) to the sum of PUD and *disappointment from private consumption* (PRD).

$$RD_t = PUD_t / (PUD_t + PRD_t) \tag{1}$$

If RD is higher than 0.5, it means that people get more disappointed from the public involvements than from the private consumption. Then *public interest* (PUI) will decrease and *private interest* (PRI) will increase. If RD is lower than 0.5, PUI will increase and PRI will decrease. The value of RD ranges between 0 and 1. With a table function, RD is transformed into a variable called impact of relative disappointment on allocation of interest (not shown in Figure 3), which regulates the flow between the both stocks PRD and PUD. It is assumed that the sum of PUI and PRI is a constant of 100. In other words, what flows out of PUI will flow into PRI and vice versa, and this flow is influenced by RD.
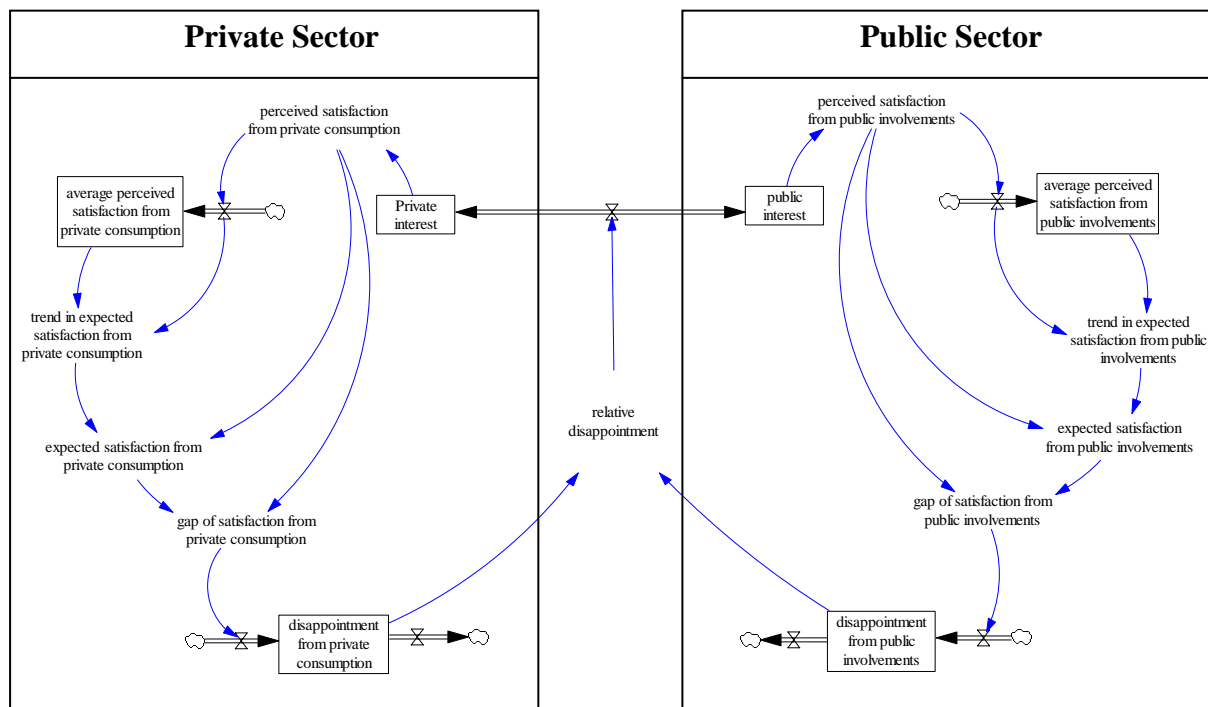

Figure 2: Macro-sectors of the model

Having described how the two macro-sectors are linked, the micro-structure of the model will be portrayed now. Since the both sectors are symmetrical in our model, we will only illustrate the private sector as a represent of both sectors.

PRI is transformed into *perceived satisfaction from private consumption* (PSPR) through a variable named impact of public interest on perceived satisfaction (not shown in Figure 3). In order to calculate *expected satisfaction from private consumption* (ESPR), the *trend in desired satisfaction from private consumption* (TPR) is computed as follows:

$$TPR_t = \left(\frac{\partial APSPR}{\partial t}\right) / APSPR_t \qquad (2)$$

where APSPR is the stock *average perceived satisfaction from private consumption.* $\left(\dfrac{\partial APSPR}{\partial t}\right)$ represents the inflow into the stock APSPR, which is computed through dividing PSPR by the adjustment time to change PSPR.

As discussed in the previous text, acquisition of consumer goods or services not only inflates people's perceived satisfaction from private consumption (PSPR), but enhances even more their expected satisfaction from consuming the next unit of goods or services (DSPR). In other words, expected satisfaction always exceeds the perceived satisfaction from the real consumption experiences. Therefore, in our model, citizens form their *expected satisfaction from private consumption* (ESPR) based on their perceived satisfaction from private consumption (PSPR) and the trend (TPR) as follows:

$$ESPR_t = PSPR_t \times (1 + TPR_t) \qquad (3)$$

This approach is in accordance with Forrester's claim about smoothing of information (Forrester 1961), which is present in every decision-making point in the system. According to Forrester, "smoothing is a process of taking a series of past information values and attempting to form an estimate of the present value of the underlying significant content of the data" (Forrester 1961, Appendix E).

The difference between *expected satisfaction from private consumption* (ESPR) and *perceived satisfaction from private consumption* (PSPR) is represented by *gap between expected and perceived satisfaction from private consumption* (GAP).

$$GAP_t = ESPR_t - PSPR_t \qquad (4)$$

This gap, which is endogenously embedded in our modern society, will lead to new disappointment (ND) and an accumulation of the stock *disappointment from private consumption* (DPR), which is represented as an inflow into the stock DPR in our model. At the same time, people also forget their disappointing experiences with time (FD). This approach is reflected with an outflow flowing out of the stock DPR.

$$\frac{dDPR}{dt} = ND(t) - FD(t) \qquad (5)$$

The model formalization for the public sector is symmetric to the private sector we just illustrated.

Simulation Results

Having formalized our model, this section will deal with the behavior generated from the dynamic explained before. In the following text, we will first present Hirschman's expected behavior of private and public interest. Then we will validate our model with the behavior

reproduction tests (Sterman 2000), in which we show that the behavior exhibited by our model complies with what Hirschman expected.

With following words, Hirschman provides some description for his expectation concerning how private and public interest should interact with each other: "…both pursuits of happiness, the private and the public, have intrinsically monopolizing ambitions, and a stable equilibrium between the two is impossible to achieve" (Hirschman 1982, p.99). Robert H. Frank states the observed behavior by Hirschman with even more clear words in the foreword he contributes to the twentieth-anniversary edition of Hirschman's *Shifting Involvements*: "His basic observation, which he documents persuasively with examples from several modern Western democracies, is that societies seem to oscillate… between modes of private acquisitiveness and public spiritedness" (Hirschman 1982, p.xi).

Figure 3 shows the simulation result over a period of 100 years for the private and public interest stock. In the model, the sum of private and public interest is set to be 100. At the beginning of the simulation, public interest is set as 52.6 whereas private interest equals to 47.4. Both private and public interest oscillate around the average value of 50 periodically and exhibit a so-called sustained oscillating behavior. In other words, the behavior of our model is in accordance with what Hirschman expected.

Figure 3: Behavior Public vs. Private Interest

Besides Hirschman's book, we could find more evidence for the cyclic behavior generated from our model. Figure 4 shows the voting rate in the USA from 1968 to 2000. "Voter turnout is one measure of citizen participation in politics" (IDEA 2002, p.75), which is "the number of votes divided by the number of names on the voters' register, expressed as a percentage" (IDEA 2002, p.120). Thus, voter turnout could give some hints on how much a society is engaged into public interest during the respective period. Figure 4 starts from 1968 with high public interest in the American society, which marks the year of anti-Vietnam war

demonstrations in the USA and the end of Johnson era. The next 3 decades shows an oscillating behavior similar to what our model generates.
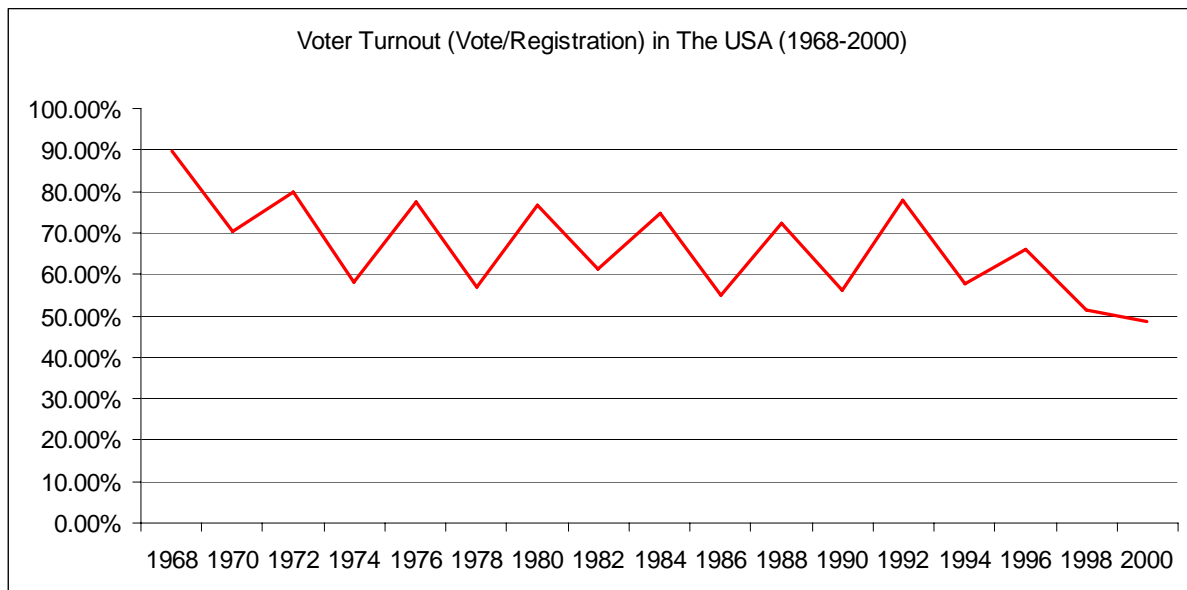

Figure 4: Voting Rate in USA (1968- 2000)

Source: IDEA (International Institute for Democracy and Electoral Assistance)

Conclusions and Discussion

In this paper, a system dynamics model to test Hirschman's theory of shifting societal interest and involvements between private and public sectors, is provided. The simulations results proves the dynamic consistency of Hirschman's theory and confirms the reference mode stated in his book. It is hoped, that the second order model presented in this paper, could help to illustrate the theory and provided some new insights into the dynamics ruling the private-public cycle in our societal life.

This paper presents our first attempt to reconstruct the compelling story Hirschman tries to tell in his book. Given the comprehensiveness of his story, more work can be done in the future to incorporate more factors in order to make our model more realistic. For example, in the current stage, our model shows a complete symmetry between the private and public cycle. In other words, the periods of intensive public involvements and the periods of widespread concentration on private interest within a society, have almost equal length. However, reality often offers another picture as Hirschman tries to alert us: "An asymmetry between private and public life must be noted here. It is easy for private pursuits almost wholly to fill our lives and to squeeze out public-regarding activities altogether; this is, in fact, what typically happens a great deal of the time under modern conditions and has been unbeautiful named "privatization." But the opposite process can occur only exceptionally…" (Hirschman 1982, p.97). For the next developing stage of our work, some new features, including the asymmetry between private and public life, will be added to our model.

Second order models, as state in the previous text, have the potential of testing and completing existing theories as well as shedding new light on the dynamic processes standing behind the theories. There exist a large number of theories, for instance, in social science disciplines such as philosophy, sociology and psychology, though intuitively gripping or even

logically convincingly stated, however, are hardly testable with calculus or data. Second order models, could be a powerful tool for testing these theories for the reasons stated before. However, as we already made clear, in spite of its highly interesting nature and great potential, second order model determines a less explored research field within the system dynamics society. Therefore, it is also hoped by the authors, that this present paper could add some bricks in this research field and call more system dynamists' attention to this research topic.

References

Barlas, Y. "Comments on "on the very Idea of a System Dynamics Model of Kuhnian Science"." *System Dynamics Review* 8, no. 1 (1992): 43-47.

Bell, David E. "Disappointment in Decision Making Under Uncertainty." *Operations research* 33, no. 1 (1985): 1-27.

Craib, Ian. *The Importance of Disappointment.* London: Routledge, 1994.

Dijk, W. W. van & Zeelenberg, M. "What do we Talk about when we Talk about Disappointment? Distinguishing Outcome-Related Disappointment from Person-Related Disappointment." *Cognition and Emotion* 16, no. 6 (2002): 787-807.

Forrester, Jay Wright. *Industrial Dynamics.* Cambridge, Mass.: M.I.T. Press, 1961.

Hall, Roger I. "A System Pathology of an Organization: The Rise and Fall of the Old Saturday Evening Post." *Administrative Science Quarterly* 21, no. 2 (1976): 185-211.

Hanneman, Robert A., Randall Collins, and Gabriele Mordt. "Discovering Theory Dynamics by Computer Simulation: Experiments on State Legitimacy and Imperialist Capitalism." *Sociological Methodology* 25, (1995): 1-46.

Hirschman, Albert O. *Exit, Voice, and Loyalty : Responses to Decline in Firms, Organizations, and States.* Cambridge, Mass.: Harvard University Press, 1970.

Hirschman, Albert O., and Joseph Alois Schumpeter. *Shifting Involvements : Private Interest and Public Action.* 20th anniversary ed. Princeton, N.J.: Princeton University Press, 2002.

Inman, J. Jeffrey, James S. Dyer, and Jianmin Jia. "A Generalized Utility Model of Disappointment and Regret Effects on Post-Choice Valuation." *Marketing Science* 16, no. 2 (1997): 97-111.

Jia, Jianmin, James S. Dyer, and J. C. Butler. "Generalized Disappointment Models." *Journal of Risk and Uncertainty* 22, no. 1 (2001): 59-78.

Larsen, E., and A. Lomi. "Representing Change: A System Model of Organizational Inertia and Capabilities as Dynamic Accumulation Processes." *Simulation Modelling Practice and Theory* 10, no. 5-7 (2002): 271-296.

Larsen, E. R., and A. Lomi. "Resetting the Clock: A Feedback Approach to the Dynamics of Organisational Inertia, Survival and Change." *The Journal of the Operational Research*

Society 50, no. 4, System Dynamics for Policy, Strategy and Management Education (1999): 406-421.

Loomes, Graham, and Robert Sugden. "Disappointment and Dynamic Consistency in Choice Under Uncertainty." *The Review of Economic Studies* 53, no. 2 (1986): 271-282.

Masuch, Michael. "Vicious Circles in Organizations." *Administrative Science Quarterly* 30, no. 1 (1985): 14-33.

Mitchell, Margaret. *Gone with the Wind.* New York: Macmillan, 1936.

Nietzsche Friedrich, *Human, All Too Human. A Book for Free Spirits.* University of Nebraska Press 1984

Pintor, R. L., M. Gratschew, J. Adimi, J. Ballington, C. Brians, S. Lounev, D. Nohlen, P. Norris, S. Notosusanto, K. Sullivan, and E. Urrutia. "Voter Turnout since 1945- A Global Report." Available from http://www.idea.int/publications/vt/upload/VT_screenopt_2002.pdf.

Radzicki, M. J. "Reflections on "on the very Idea of a System Dynamics Model of Kuhnian Science"." *System Dynamics Review* 8, no. 1 (1992): 49-53.

Robinson, Patrick J. "Delight, Disappointment, Dismay, Disbelief." *Journal of Marketing Research* 12, no. 1 (1975): 118-119.

Sastry, M. Anjali. "Problems and Paradoxes in a Model of Punctuated Organizational Change." *Administrative Science Quarterly* 42, no. 2 (1997): 237-275.

Sterman, John. *Business Dynamics : Systems Thinking and Modeling for a Complex World.* Boston: Irwin/McGraw-Hill, 2000.

Sterman, John D. "Response to "on the very Idea of a System Dynamics Model of Kuhnian Science"." *System Dynamics Review* 8, no. 1 (1992): 35-42.

Sterman, John D. "The Growth of Knowledge: Testing a Theory of Scientific Revolutions with a Formal Model." *Technological Forecasting and Social change* 28, no. 2 (1985): 93-122.

Sterman, John D., and Jason Wittenberg. "Path Dependence, Competition, and Succession in the Dynamics of Scientific Revolution." *Organization Science* 10, no. 3, Special Issue: Application of Complexity Theory to Organization Science (1999): 322-341.

Wilco W. Van Dijk. "Not having what You Want Versus having what You Don't Want. the Impact of Type of Negative Outcome on the Experience of Disappointment and Related Emotions." *Cognition and Emotion* 13, no. 2 (1999): 129-148.

Wittenberg, J. "On the very Idea of a System Dynamics Model of Kuhnian Science." *System Dynamics Review* 8, no. 1 (1992): 21-33.

Zeelenberg, M., Dijk, W.W. van, Manstead, A. S. R., & Pligt, J. van der. "On Bad Decisions and Disconfirmed Expectancies: Regret, Disappointment and Decision-Making." *Cognition and Emotion* 14, no. 4 (2000): 521-541.

Appendix

Allocation of interest=
       IF THEN ELSE(impact of relative disappointment on allocation of interest<0, impact of relative disappointment on allocation of interest\
          *public interest, impact of relative disappointment on allocation of interest*private interest\
)
    ~
    ~ |

private interest= INTEG (
       -Allocation of interest,
          47.4)
    ~   Dmnl [0,100,100]
    ~ |

public interest= INTEG (
       Allocation of interest,
          52.6)
    ~   Dmnl [0,100,100]
    ~ |

gap of satisfaction from public involvement=
       perceived satisfaction from public involvement-expected satisfaction from public
    ~   Satisfaction Unit
    ~ |

trend in expected satisfaction from public=
       (change in average public/average perceived satisfaction from public involvements)*3
    ~   1/year
    ~ |

average perceived satisfaction from public involvements= INTEG (
       change in average public,
          30.05)
    ~   Satisfaction Unit
    ~ |

disappointment from public involvement= INTEG (
       +new public disappointment-forgotten public disappointment,
          3)
    ~   Satisfaction Unit
    ~ |

averaging time public=
       10
    ~   year
    ~ |

delay in perceiving gap in public involvement=
        1
        ~   year
        ~ |

change in average public=
        (perceived satisfaction from public involvement-average perceived satisfaction from public involvements\
)/averaging time public
        ~   Satisfaction Unit/year
        ~ |

expected satisfaction from public=
        perceived satisfaction from public involvement*(1+trend in expected satisfaction from public\
)
        ~   Satisfaction Unit
        ~ |

new public disappointment=
        IF THEN ELSE(gap of satisfaction from public involvement>0, 0, (-gap of satisfaction from public involvement\
)/delay in perceiving gap in public involvement)
        ~   Satisfaction Unit/year
        ~ |

forgotten public disappointment=
        disappointment from public involvement/time to forget past disappointment in public involvement
        ~   Satisfaction Unit/year
        ~ |

time to forget past disappointment in public involvement=
        20
        ~   year
        ~ |

time to forget past disappointment in private consumption=
        20
        ~   year
        ~ |

forgotten private disappointment=
        disappointment from private consumption/time to forget past disappointment in private consumption
        ~   Satisfaction Unit/year
        ~ |

disappointment from private consumption= INTEG (
        +new private disappointment-forgotten private disappointment,

2.7)
~   Satisfaction Unit
~ |

gap of satisfaction from private consumption=
        perceived satisfaction from private cosumption-expected satisfaction from private
        ~   Satisfaction Unit
        ~ |

new private disappointment=
        IF THEN ELSE(gap of satisfaction from private consumption>0, 0, (-gap of
satisfaction from private consumption\
)/delay in perceiving gap in private consumption)
        ~   Satisfaction Unit/year
        ~   Satisfaction units = - Disappointment units
        |

delay in perceiving gap in private consumption=
        1
        ~   year
        ~ |

average perceived satisfaction from private consumption= INTEG (
        change in average,
                30.05)
        ~   Satisfaction Unit
        ~ |

averaging time private=
        10
        ~   year
        ~ |

change in average=
        (perceived satisfaction from private cosumption-average perceived satisfaction from
private consumption\
)/averaging time private
        ~   Satisfaction Unit/year
        ~ |

expected satisfaction from private=
        perceived satisfaction from private cosumption*(1+trend in expected satisfaction from
private\
)
        ~   Satisfaction Unit
        ~ |

perceived satisfaction from private cosumption=
        SMOOTH(impact of private interest on perceived satisfaction*reference perceived
satisfaction from private consumption\

, delay in perception private satisfaction
)
~   Satisfaction Unit
~ |

trend in expected satisfaction from private=
       (change in average/average perceived satisfaction from private consumption)*3
~   1/year
~ |

perceived satisfaction from public involvement=
       SMOOTH(impact of public interest on percived satisfaction*reference perceived
satisfaction from public involvement\
              , delay in perception public satisfaction
)
~   Satisfaction Unit
~ |

delay in perception private satisfaction=
       2
~
~ |

delay in perception public satisfaction=
       2
~
~ |

impact of private interest on perceived satisfaction=
       impact of private interest on perceived satisfaction table(private interest)
~   Dmnl
~ |

impact of private interest on perceived satisfaction table(
       [(0,0)-(100,3)],(0,0),(100,3))
~   Dmnl
~ |

impact of public interest on percived satisfaction=
       impact of public interest on perceived satisfaction table(public interest)
~   Dmnl
~ |

impact of public interest on perceived satisfaction table(
       [(0,0)-(100,3)],(0,0),(100,3))
~   Dmnl
~ |

reference perceived satisfaction from private consumption=
       20

~		Satisfaction Unit
~			|

reference perceived satisfaction from public involvement=
	20
	~		Satisfaction Unit
	~			|

impact of relative disappointment on allocation of interest=
	impact of disappointment on allocation of interest table(relative disappointment)
	~		Dmnl
	~			|

impact of disappointment on allocation of interest table(
	[(0,-0.05)-(1,0.05)],(0,0.05),(0.5,0),(1,-0.05))
	~
	~			|

relative disappointment=
	disappointment from public involvement/(disappointment from private
consumption+disappointment from public involvement\
		)
	~		Dmnl
	~			|

****
	.Control
***~
		Simulation Control Parameters
	|

FINAL TIME = 100
	~		year
	~		The final time for the simulation.
	|

INITIAL TIME = 0
	~		year
	~		The initial time for the simulation.
	|

SAVEPER = 0.0625
	~		year [0,?]
	~		The frequency with which output is stored.
	|

TIME STEP = 0.03125
	~		year [0,?]
	~		The time step for the simulation.
	|

\\\---/// Sketch information - do not modify anything except names
V300 Do not put anything below this section - it will be ignored
*View 1
$192-192-192,0,Times New Roman|12||0-0-0|0-0-0|0-0-255|-1--1--1|-1--1--1|96,96,5
10,1,public interest,561,317,40,20,3,3,0,0,0,0,0,0
10,2,private interest,848,316,40,19,3,3,0,0,0,0,0,0
10,3,disappointment from private consumption,952,631,53,26,3,3,0,0,0,0,0,0
10,4,disappointment from public involvement,464,618,50,26,3,3,0,0,0,0,0,0
12,5,48,192,627,10,8,0,3,0,0,-1,0,0,0
1,6,8,4,4,0,0,22,0,0,0,-1--1--1,,1|(364,628)|
1,7,8,5,100,0,0,22,0,0,0,-1--1--1,,1|(252,628)|
11,8,48,308,628,6,8,34,3,0,0,1,0,0,0
10,9,new public disappointment,308,655,48,19,40,3,0,0,-1,0,0,0
12,10,48,715,621,10,8,0,3,0,0,-1,0,0,0
1,11,13,10,4,0,0,22,0,0,0,-1--1--1,,1|(660,621)|
1,12,13,4,100,0,0,22,0,0,0,-1--1--1,,1|(558,621)|
11,13,48,609,621,6,8,34,3,0,0,1,0,0,0
10,14,forgotten public disappointment,609,648,50,19,40,3,0,0,-1,0,0,0
12,15,48,1185,623,10,8,0,3,0,0,-1,0,0,0
1,16,18,3,4,0,0,22,0,0,0,-1--1--1,,1|(1038,625)|
1,17,18,15,100,0,0,22,0,0,0,-1--1--1,,1|(1129,625)|
11,18,48,1077,625,6,8,34,3,0,0,1,0,0,0
10,19,new private disappointment,1077,652,48,19,40,3,0,0,-1,0,0,0
12,20,48,761,625,10,8,0,3,0,0,-1,0,0,0
1,21,23,20,4,0,0,22,0,0,0,-1--1--1,,1|(801,624)|
1,22,23,3,100,0,0,22,0,0,0,-1--1--1,,1|(871,624)|
11,23,48,837,624,6,8,34,3,0,0,1,0,0,0
10,24,forgotten private disappointment,837,651,53,19,40,3,0,0,-1,0,0,0
10,25,relative disappointment,724,552,73,19,8,3,0,0,0,0,0,0
1,26,4,25,1,0,0,0,0,64,0,-1--1--1,,1|(565,544)|
1,27,3,25,1,0,0,0,0,64,0,-1--1--1,,1|(855,549)|
10,28,impact of disappointment on allocation of interest table,901,463,58,28,8,3,0,0,0,0,0,0
10,29,impact of relative disappointment on allocation of
interest,697,441,80,19,8,3,0,0,0,0,0,0
1,30,25,29,1,0,0,0,0,64,0,-1--1--1,,1|(687,500)|
1,31,28,29,0,0,0,0,0,64,0,-1--1--1,,1|(816,453)|
10,32,impact of public interest on percived satisfaction,501,187,75,19,8,3,0,0,0,0,0,0
10,33,impact of public interest on perceived satisfaction table,574,75,85,19,8,3,0,0,0,0,0,0
1,34,1,32,1,0,0,0,0,64,0,-1--1--1,,1|(561,245)|
1,35,33,32,0,0,0,0,0,64,0,-1--1--1,,1|(541,125)|
10,36,impact of private interest on perceived satisfaction,937,185,78,19,8,3,0,0,0,0,0,0
10,37,impact of private interest on perceived satisfaction table,771,106,78,28,8,3,0,0,0,0,0,0
1,38,37,36,0,0,0,0,0,64,0,-1--1--1,,1|(856,147)|
1,39,2,36,1,0,0,0,0,64,0,-1--1--1,,1|(856,227)|
10,40,perceived satisfaction from public involvement,228,126,75,19,8,3,0,0,0,0,0,0
10,41,reference perceived satisfaction from public involvement,107,46,73,28,8,3,0,0,0,0,0,0
1,42,41,40,0,0,0,0,0,64,0,-1--1--1,,1|(168,86)|
10,43,reference perceived satisfaction from private
consumption,1304,65,75,28,8,3,0,0,0,0,0,0

10,44,perceived satisfaction from private consumption,1125,124,77,19,8,3,0,0,0,0,0,0
1,45,43,44,0,0,0,0,64,0,-1--1--1,,1|(1212,94)|
10,46,delay in perception public satisfaction,320,39,60,19,8,3,0,0,0,0,0,0
1,47,46,40,0,0,0,0,2,65,0,-1--1--1,|12||255-0-0,1|(279,77)|
10,48,delay in perception private satisfaction,1017,51,60,19,8,3,0,0,0,0,0,0
1,49,48,44,0,0,0,0,2,65,0,-1--1--1,|12||255-0-0,1|(1064,83)|
1,50,36,44,1,0,0,0,0,64,0,-1--1--1,,1|(1012,138)|
1,51,32,40,1,0,0,0,0,64,0,-1--1--1,,1|(384,132)|
10,52,average perceived satisfaction from private
consumption,1371,227,55,31,3,3,0,0,0,0,0,0
12,53,48,1143,223,10,8,0,3,0,0,-1,0,0,0
1,54,56,52,4,0,0,22,0,0,0,-1--1--1,,1|(1278,223)|
1,55,56,53,100,0,0,22,0,0,0,-1--1--1,,1|(1190,223)|
11,56,48,1234,223,6,8,34,3,0,0,1,0,0,0
10,57,change in average,1234,242,56,11,40,3,0,0,-1,0,0,0
10,58,averaging time private,1190,328,46,19,8,3,0,0,0,0,0,0
10,59,trend in expected satisfaction from private,1385,354,52,28,8,3,0,0,0,0,0,0
1,60,44,57,1,0,0,0,0,64,0,-1--1--1,,1|(1229,148)|
1,61,58,57,1,0,0,0,0,64,0,-1--1--1,,1|(1185,275)|
1,62,52,59,1,0,0,0,0,64,0,-1--1--1,,1|(1381,268)|
1,63,52,57,1,0,0,0,0,64,0,-1--1--1,,1|(1322,267)|
10,64,expected satisfaction from private,1338,447,60,19,8,3,0,0,0,0,0,0
1,65,59,64,0,0,0,0,0,64,0,-1--1--1,,1|(1362,398)|
1,66,44,64,1,0,0,0,0,64,0,-1--1--1,,1|(1099,239)|
1,67,57,59,1,0,0,0,0,64,0,-1--1--1,,1|(1248,298)|
10,68,gap of satisfaction from private consumption,1095,473,74,19,8,3,0,0,0,0,0,0
1,69,64,68,1,0,0,0,0,64,0,-1--1--1,,1|(1233,481)|
1,70,44,68,1,0,0,0,0,64,0,-1--1--1,,1|(1035,288)|
1,71,68,18,1,0,0,0,0,64,0,-1--1--1,,1|(1132,541)|
10,72,delay in perceiving gap in private consumption,1267,704,80,19,8,3,0,0,0,0,0,0
1,73,72,19,0,0,0,0,0,64,0,-1--1--1,,1|(1168,676)|
10,74,time to forget past disappointment in private
consumption,923,741,79,28,8,3,0,0,0,0,0,0
1,75,74,24,1,0,0,0,0,64,0,-1--1--1,,1|(850,698)|
1,76,3,24,1,0,0,0,0,64,0,-1--1--1,,1|(909,671)|
10,77,average perceived satisfaction from public involvements,67,202,51,32,3,3,0,0,0,0,0,0
12,78,48,271,203,10,8,0,3,0,0,-1,0,0,0
1,79,81,77,4,0,0,22,0,0,0,-1--1--1,,1|(154,203)|
1,80,81,78,100,0,0,22,0,0,0,-1--1--1,,1|(232,203)|
11,81,48,197,203,6,8,34,3,0,0,1,0,0,0
10,82,change in average public,197,230,57,19,40,3,0,0,-1,0,0,0
10,83,averaging time public,245,292,51,17,8,3,0,0,0,0,0,0
10,84,trend in expected satisfaction from public,98,351,73,19,8,3,0,0,0,0,0,0
10,85,expected satisfaction from public,173,458,60,19,8,3,0,0,0,0,0,0
10,86,gap of satisfaction from public involvement,408,467,74,19,8,3,0,0,0,0,0,0
1,87,40,82,1,0,0,0,0,64,0,-1--1--1,,1|(226,164)|
1,88,83,82,1,0,0,0,0,64,0,-1--1--1,,1|(225,248)|
1,89,77,82,1,0,0,0,0,64,0,-1--1--1,,1|(110,272)|
1,90,82,84,1,0,0,0,0,64,0,-1--1--1,,1|(189,304)|
1,91,77,84,1,0,0,0,0,64,0,-1--1--1,,1|(49,269)|

1,92,84,85,1,0,0,0,0,64,0,-1--1--1,,1|(107,417)|
1,93,85,86,1,0,0,0,0,64,0,-1--1--1,,1|(277,486)|
1,94,86,8,1,0,0,0,0,64,0,-1--1--1,,1|(326,615)|
1,95,40,85,1,0,0,0,0,64,0,-1--1--1,,1|(329,302)|
1,96,40,86,1,0,0,0,0,64,0,-1--1--1,,1|(432,348)|
10,97,delay in perceiving gap in public involvement,183,735,72,19,8,3,0,0,0,0,0,0
1,98,97,9,0,0,0,0,0,64,0,-1--1--1,,1|(239,698)|
10,99,time to forget past disappointment in public involvement,495,747,77,28,8,3,0,0,0,0,0,0
1,100,99,14,1,0,0,0,0,64,0,-1--1--1,,1|(593,717)|
1,101,4,14,1,0,0,0,0,64,0,-1--1--1,,1|(527,686)|
1,102,104,2,4,0,0,22,0,0,0,-1--1--1,,1|(759,316)|
1,103,104,1,100,0,0,22,0,0,0,-1--1--1,,1|(649,316)|
11,104,524,704,316,6,8,34,3,0,0,1,0,0,0
10,105,Allocation of interest,704,343,56,19,40,3,0,0,-1,0,0,0
1,106,29,105,1,0,0,0,0,64,0,-1--1--1,,1|(720,384)|
1,107,1,105,1,0,0,0,0,64,0,-1--1--1,,1|(669,365)|
1,108,2,105,1,0,0,0,0,64,0,-1--1--1,,1|(786,369)|