Legal Dynamics

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Abstract
One of the areas barely investigated by system dynamicists is the law. Although this may seem understandable, there are intriguing dynamic aspects in legal systems and particularly in the field of the administration of justice. In order to investigate whether a legal procedure could be modelled from a system dynamics perspective and to see whether this could lead to deeper insights into the mechanisms beyond the existing method of 'trial and error', the Dutch asylum procedure over the period 1980-2002 was modelled. This paper describes the results of this study revealing unprecedented feedback loops implying the need for further research of the internal effects of legal procedures i.e. the need for a system dynamic approach of the law, or stated otherwise, the existence of a new approach: legal dynamics.

Key words
Legal dynamics; public policy; legal reasoning; administration of justice; asylum procedure; legislation; systems thinking; model building.

1 Introduction

In his recent work on system dynamics, Sterman (2000, p. vii) states: "*Tools and methods for system dynamics modelling, the library of successful applications, and insights into the effective use of the tools with executives and organizations are all expanding rapidly*." Although the quantity of the problems investigated and the size of this library are impressive, a number of fields is still left untouched. For instance, the domain of law and in particular the administration of justice is barely researched from the perspective of system dynamics.

My initial question some years ago on the SD discussion list about any known related research on law and system dynamics evoked a deafening silence, which was ultimately broken by George P. Richardson stating[1]: "What are the dynamics of interest in this area?" I could have interpreted this reply as a serious reprimand implying to redirect my focus. However, I persisted and found myself in unknown territory inhabited by all sorts of people but lawyers. Apparently, no one had ever crossed the bridge between the legal domain and system dynamics.[2]

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1 George Richardson notably continued the discussion, referring to possibly related work and commenting extensively on my model.

2 Besides the work of McCold (1993) on prison population and studies mainly on drugs related crime, I could not find any related research on the administration of justice.

This might have a number of reasons. First, the domain of law is mainly associated with moneymaking activities of attorneys at law portrayed in soaps – not with dynamic problems. Second, legal reasoning seems to resemble, roughly speaking, the reasoning of taxi drivers: how to get from A to B without getting caught violating traffic rules.[3] It is not associated with feedback or circular causality. Third, law is not considered related to science,[4] at least in the American tradition.[5]

In this paper, I will report on my findings investigating system dynamics modelling of the administration of justice in legal procedures. In the next section, I will argue that legal procedures are an interesting problem field from the perspective of system dynamics. In section three I will elaborate on asylum seekers and the Dutch asylum procedure as an example of a legal domain. The subsequent sections will deal with the main points of my model on the Dutch asylum procedure, the feedback loops detected and the obstacles I encountered building confidence in my model. Also, I will touch upon the actual building of the model, the quantification of its parameters and the extensive process of testing the model.[6] Finally, I will mention briefly the implications of my findings regarding government policy on this type of issue and try to answer the question suggested in the title of this paper, whether this is sufficient to introduce the notion of 'legal dynamics'.

2 Dynamics of what?

Despite apparent differences and suggestions of incompatibility, the system of law, particularly the administration of justice,[7] has intriguing dynamics and feedback loops of unprecedented structure. The main reason for this lies in the essence of law. Whereas any other 'business' is ultimately about the result, law is judged by its procedure rather than its outcome.[8] For instance, in an automobile production line the final evaluation of its quality would be whether a produced car meets a number of standards regardless of the means of production. If it does, the car can be sold, if not it is rejected. If, however, this production line would represent a fair legal procedure, the quality of the result (i.e. the verdict) would be irrelevant. Even 'constructed' perfectly both parties would still be entitled to appeal, rejecting the result.

In focusing on the procedure rather than the outcome, for example, it can be profitable lengthening the procedure instead of shortening it. This implies the existence

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3 A typical example of one-way causal reasoning.

4 In the English language, science is restricted to natural science or math. Other fields, like humanities or literature are excluded – which explains the plead of Ackoff (2001) for the introduction of the field 'scianities'. However, the continental (French or German) terminological tradition already discriminates between different types of science, speaking therefore of science of law, science of humanities, science of literature and so on.

5 Loevinger (1949/1971) started a terminological discussion about law, i.e. jurisprudence. He suggested to study it (i.e. law) scientifically (which he called jurimetrics) arguing: 'The inescapable fact is that jurisprudence bears the same relation to a modern science of jurimetrics as astrology does to astronomy, or phrenology to psychology'.

6 The model is built using Ithink (© High Performance Systems). It is necessary to mention the invaluable and ongoing support of HPS, Dan Lloyd in particular, answering all of my trivial and tough questions regarding modelling techniques.

7 More in particular: the implementation of legal or legislative policy.

8 Of course, the outcome of a legal procedure is relevant. However, provided that the rules for the administration of justice are considered right – and not just valid – the quality of justice is related to the quality of its procedure.

of completely different feedback loops involving backlogs. In a normal situation of, say, a supermarket with a number of checkouts, customers will have to decide which queue to join. The main consideration or argument in this choice will be the observed length of the queues and the perception of the estimated waiting time. In order to wait as little as possible, the shortest queue is selected. Besides the perception of most people that they often have selected the wrong queue, the overall effect is an evenly distribution of the customers over the queues optimising the production capacity of the checkouts available. A simple balancing feedback loop is thus presented: the longer the waiting time seems to be for a certain check-out, the less plausible it is that newly arrived customers will join that particular queue. Consequently, over time the queue will decrease becoming one of the shorter queues inviting customers to join it again.

A legal procedure, however, could give a loop with opposite polarity. Now, assuming that it can be profitable to lengthen a procedure, customers might join the longest queue available generating a reinforcing loop resulting in exponential growth, as far as the queue is concerned. This implies that the legal domain – as a potential system dynamic problem field – has at least two different scopes. First, the regular object of interest is concerned with *external* effects. These are the effects that relate to the addressee of a regulation. With reference to the example of the production line, the focus then is on the product, the result. That focus is not discussed here any further, since it resembles 'regular' dynamics.

The second object of interest is concerned with the *internal* effects of the administration or implementation of justice and concentrates on the processing of (legal) requests and the dynamic relations *within* the organisations and departments concerned. This so far overlooked focus constitutes the topic of this paper.

3 Asylum seekers

The legal procedure investigated here is the Dutch asylum procedure over the period 1980 – 2002. Not being a strictly Dutch issue, I had to extend my research to a (limited) European[9] context.[10]

Starting point was the observation that the number of asylum seekers in Europe increased from an average of 15.000 per month over the period 1980 – 1990, peaking to an inflow of more than 60.000 in 1992 and 1993, falling to 20.000 and rising again until about 35.000 per month (figure 1).[11] Until 1992, two third applied for asylum in Germany[12], leaving a relatively low percentage of the total European inflow to the other European countries. A normative distribution[13] would imply only some 20% for Germany. Given the absence of a communal European asylum policy[14] and the reluctance to

9 The term Europe here used indicates the following countries: Norway, Finland, Sweden, Denmark, Germany, Austria, Switzerland, Belgium, The Netherlands, Luxembourg, The United Kingdom, Ireland, France, Spain, Portugal, Italy and Greece; these countries cover Western-Europe (as a geographical indication).

10 Asylum is from the perspective of receiving countries, in the end, a distribution issue.

11 It is interesting to compare these European asylum applications figures with those of other non-European countries: in 2000 Western Europe received a total of 420.000 applications, whereas the USA 'only' received 64.000, Cananda received 38.000 and Australia had 13.000.

12 Until the unification of Eastern and Western Germany in 1990, the German figures relate to Western Germany.

13 With a normative distribution, each country receives a percentage of the total (European) inflow that equals the percentage of the population of a country compared to the total population of Europe.

14 European countries are still discussing form and consequences of implementing a European policy, i.e. 'burden sharing' (Noll 2000).

implement the possibility of labour immigration from outside Europe[15], each country tried to be as deterrent as possible,[16] while advocating the need for a fair treatment of asylum seekers who have the right to apply for asylum in accordance with the Geneva Convention (on refugees).

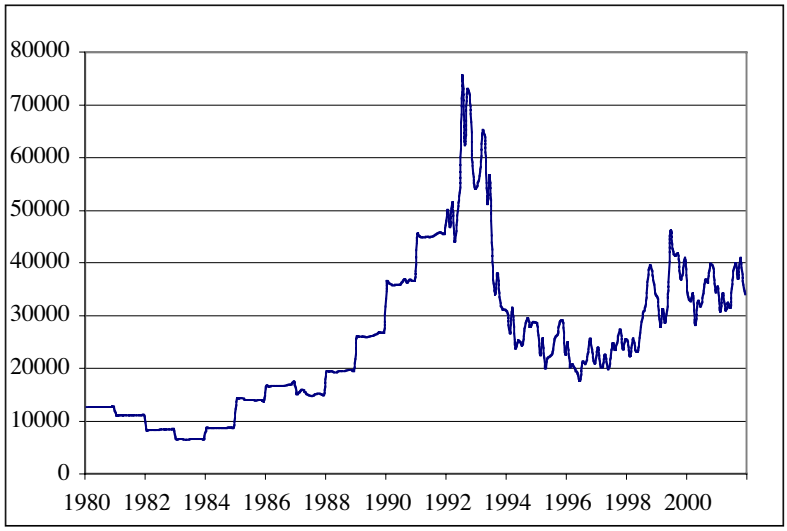

Figure 1 Absolute number of monthly inflow of asylum seekers in Europe (1980-2002)

In 1992 and 1993 – just after the fall of the 'iron curtain' and the start of the prologue of the war on the Balkan in former Yugoslavia – an increase of violent assaults on foreigners in Germany occurred. This led[17] to an important change in the 'selection' of destination countries of asylum seekers. Germany became much less popular as a result of which all other European countries, including The Netherlands, were confronted with a substantial increase of asylum seekers (figure 2) causing procedural congestion.

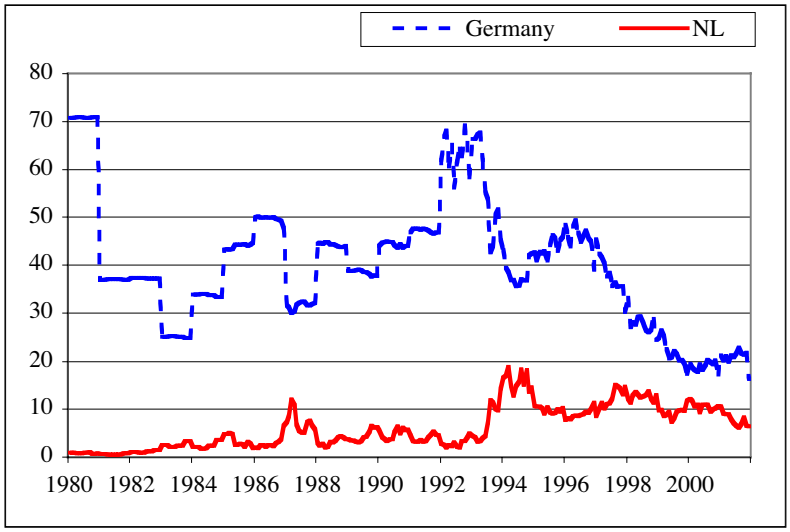

Figure 2 Percentage of total European inflow of asylum seekers in Germany and The Netherlands

15 Recently, discussions have started on the usefulness of new labour-immigration regulation in several European countries.

16 See, for instance: Hayter 2000.

17 Along with the long discussed and implemented amendment of the German Constitution weakening the right for asylum.

A second observation concerns the developments in The Netherlands. The Dutch inflow increased over the period 1980 – 2000 from an average below 2% (1980 – 1984) through a normative percentage of 4 (1984 – 1992) to 12 % (1992 – 1999). As from 2000, however, the inflow decreased to some 8%.

Another point is the increase in The Netherlands of backlogs, i.e. unhandled asylum requests, and, strangely enough, a significant increase of production capacity at the Dutch Immigration Service (IND). Along with these increases, political pressure repeatedly led to the implementation of stricter legislation in order to deter (more) asylum seekers.[18]

The question arose whether this problematic[19] behaviour (of inflow and backlogs) could be explained using system dynamics. As I will show, this is possible, although the consequences are not in line with prevalent opinions on this issue.

3.1 Asylum procedures

In order to understand the scope of the problem at hand, I have to mention briefly a couple of characteristics of the Dutch asylum procedure and touch upon some differences compared to similar procedures in other countries such as the USA.

Legislation concerning asylum and the rights of refugees can mostly be found in national Aliens Acts.[20] These acts are either based on the Geneva Convention on Refugees[21] or adapted versions of previously existing acts implementing the main idea of this Convention and accompanying Protocol. An important point is that the USA has only ratified the Protocol, whereas most other countries have ratified both the Convention and the Protocol.[22] One of the consequences is that someone who claims to be a refugee and wants to apply for asylum, can do so at the border of a country, such as The Netherlands. In the USA, however, this is only possible if the asylum seeker actually finds himself within the territory of the USA. Another important difference is that asylum applicants are allowed to stay in special asylum centres until the Dutch Justice department has decided on their case. Pending their case they are more or less free to go. This highly contrasts with the American or Australian situation in which applicants are locked up.

In the long run, almost 50% of the applicants are allowed to stay in the Netherlands either on the basis of their well-founded fear of persecution, humanitarian reasons or other reasons preventing them to go back. This implies that half of the asylum seekers is not permitted to stay any longer and has to leave the country. That, however, is a major problem since most of the asylum seekers do not have any official – valid – papers with them. This means that their identity cannot be determined nor that it is possible to determine their country of origin very easily. One of the most frequently heard arguments is that asylum seekers not having any valid papers entering a country, are liars and therefore cannot be genuine asylum seekers and have to be expelled. This,

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18 Major changes of the Dutch Aliens Acts or asylum policy were implemented in 1985, 1987, 1994, 1997 and 2001.

19 Whether the size of inflow and backlogs are *really* problematic is another discussion. This research has started with the observation that this RMoB is mostly seen as problematic.

20 This does not hold for all countries. Italy, for instance, has no asylum regulation at all.

21 Convention relating to the status of refugees, Geneva July 28th, 1951 (into force 1954). The accompanying Protocol was only drafted in 1968.

22 This has to do with the fact that the USA, on principle, do not recognize any restriction of the American Constitution by Treaties.

however, is a misconception. In most countries of origin, having a passport is a privilege for the rich and powerful and to apply for one is highly suspicious.

3.2 Procedural routes

Asylum procedures in general seem to be simple: a request is made and after investigation the request is either granted or rejected. A closer look, however, reveals a complicated picture containing a number of different procedural routes[23] and parties[24] concerned (figure 3).

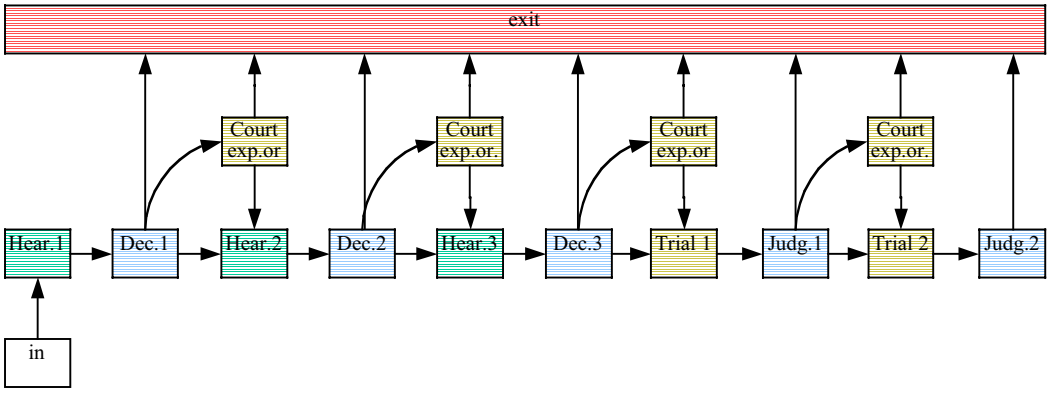

Figure 3 Procedural routes within the Dutch Asylum Procedure

Although the main objective of implementing renewed legislation was to speed up the procedure reducing the number of alternative 'routes', the general picture remained the same. In short, the request is made and assessed whether it is a valid one.[25] If so, a second hearing is organised in order to establish the soundness of the request. After this second hearing, additional information is gathered and a second decision is made.[26] If the request is rejected in this stage, there is the possibility of revision.[27] Any rejecting outcome can subsequently be presented to a court of law (trial 1) and, if still negative, can ultimately be put to a court of appeal (trial 2).

Along with this dual procedure (administrative and judicial review) there is another set of routes relevant. Since the applicant may only stay in the country pending his case, a negative outcome formally ends the procedure and forces him to leave the country, although the possibility of an official protest may exist.[28] At this point the bypass comes into sight. Given the fact that a protest implies a continuation of the procedure, the applicant has the possibility to go to court and ask the judge to suspend the expulsion order,[29] allowing him to await the outcome of his formal protest.[30]

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23 The taxi driver metaphor again forces itself projecting a street plan of possible legal procedural routes.

24 Next to the immigration service and the asylum seeker, the Department of Justice, the Foreign Office, legal aid officials, the State defending counsel, judges, courts of justice, interpreters, refugee centre officials, and agencies like Amnesty International and the UNHCR (United Nations High Commisioner for Refugees).

25 Marked in figure 3 as 'Hear.1' and 'Dec.1'.

26 Marked in figure 3 as 'Hear.2' and 'Dec.2'.

27 Since the revised Aliens Act of 2000, the actual revision phase has been removed. Instead, a so-called 'intentional phase' has been introduced.

28 A request for revision (if the request is rejected in first instance), an appeal (if rejected after revision) or a so-called higher appeal (if the first court of law dismisses the appeal).

29 Marked in figure 3 as 'Court exp.or.'

30 Due to the several revisions of the Dutch Aliens Act, the number of situations in which such a seperate request for the suspension of the expulsion order is needed, is limited.

It may be clear that lengthening the procedure is profitable and increases the chances of the asylum seeker for a positive result. Moreover, an increase of the chance to stay implies the decrease of the chance to be expelled and sent back. In the end, the latter is the actual goal of every asylum seeker: to be safe, with or without a residential permit. A final remark has to be made with respect to the length of the procedure. With reference to a number of legal principles such as 'due process' and 'fair trial', in the continental (European) legal tradition the notion of handling a case within 'due time' is recognized.[31] Within the Dutch asylum procedure this means that the total length of the procedure,[32] under circumstances, is relevant and can even lead to the granting of a residential permit.[33]

4 The Dutch asylum model

The reference mode of behaviour of this model is given in figure 4 and contains the relative inflow of asylum seekers in The Netherlands. Using relative instead of absolute numbers seems to be a logical choice since the inflow into each of the (European) countries is the result of a distribution of the total European inflow. Thus, a relative decrease in one country means a relative increase in other countries. At the same moment, these relative numbers are rarely used in national discussions on the asylum issue. This is, however, rather obvious if one realises that the absolute numbers are the criterion to determine the size of production and housing capacity needed. If the absolute European inflow over time would be constant, the differences between the two points of view (relative vs. absolute) would be irrelevant. However, as can be seen in figure 1, the absolute inflow is rather variable. Also it is highly likely that this European inflow is no part of a causal loop containing the quality of national asylum procedures or the size of existing backlogs. As a consequence, the European inflow is an exogenous factor in this model.

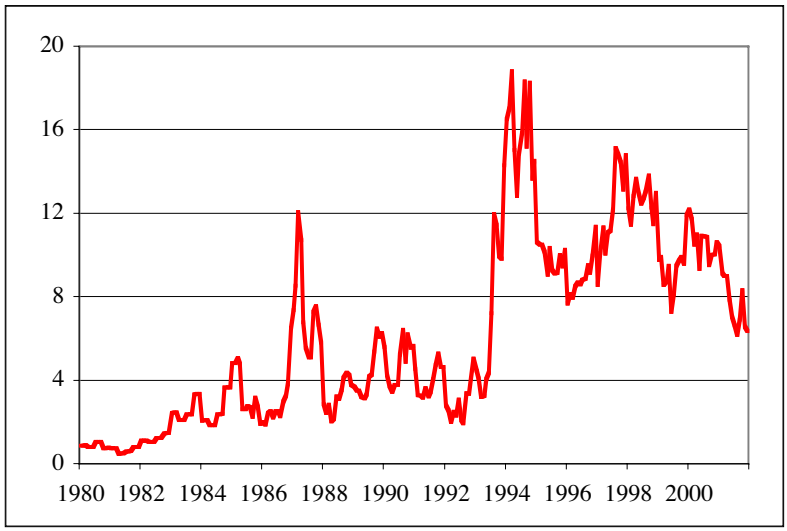

Figure 4 Percentage of total European inflow of asylum seekers in The Netherlands

31 Within the American federal Constitution this is known as the right of a 'speedy trial' (VIth amendment).
32 Handling time plus waiting time (due to backlogs).
33 Also known – in The Netherlands – as the three-year policy.

Given this European context of the model, it would have been appropriate to formulate a European asylum model including either separate submodels for each of the countries involved or a (set of) generic model(s) covering all countries. The available data, however, on most of these procedures are lacking. Still, in order to detect possible correlations between the relative inflows in the European countries, I made some statistical analyses on the monthly inflow data for each of the countries involved.[34]As a result I found that a number of clusters of countries (or regions) could be distinguished which had an internal negative correlation.

Another point was that the inflow of Germany did not seem to have a negative correlation with one of these clusters over the whole period. There was, however, a negative correlation with these clusters, though not fixed over time, but every so often shifting from one to another country or cluster of countries. This means that a negative correlation between Germany and a cluster existed for a certain period of time and then 'disappeared' or shifted. At the same time the first correlation faded, a second correlation with another cluster appeared and so on. From a geographical point of view, this consecutive appearing and disappearing of a negative correlation between Germany and a cluster ('connections'), seems to occur in a counter clockwise direction.

A German-Dutch connection existed during the period 1993-1998. As of the late nineties a shift can be noticed towards the United Kingdom, diminishing the negative correlation between Germany and The Netherlands, simultaneously increasing the one between Germany and the UK. In the absence of any further detailed data, I modelled this German 'connection' for convenience as a separate and exogenous factor.

4.1 Causal loop diagram

After lengthy discussions with different domain experts and a number of officials involved, a causal loop diagram emerged (as shown in figure 13 at the end of this paper). Within this diagram a number of feedback loops is indicated,[35] all of them having two elements in common: backlogs (i.e. unhandled requests) and political pressure (i.e. the inclination to take measures). These loops can roughly be divided into two groups: the loops (1 through 4) related to the relative attractiveness (of The Netherlands as a destination country) and the loops (5 through 14) related to the production (granting or rejecting asylum requests).

4.1.1 Attractiveness

The loops B1, B2, B3 and R4 relate to the perception of the relative attractiveness of The Netherlands: an increase of this attractiveness increases the relative inflow, the number of procedures, subsequently the backlogs, and the political pressure to 'do something about it'.

Loop B1 refers to the quality of public care. Simply put, this loop represents the *idea* that asylum seekers select their destination country on the basis of the (perceived) quality of services and facilities available in the destination country. Besides the fact that most of the asylum seekers travel with the help of so-called travel agents and do not have the faintest idea where they are finally going to, the B1 loop, in fact, represents an

34 As far as available. Until 1983 most countries have only quarterly or yearly data.

35 For convenience and reasons of comprehensibility, detailed differences belonging to different actors, such as the immigration service and judges, is left out.

illusion, an argument that is frequently used in conservative or right-wing circles, but has no factual basis whatsoever.

This needs an additional explanation for which I will use the 'bad weather' metaphor referring to the previously mentioned check-outs example. Suppose some one is walking outside and it is raining cats and dogs. Suppose also, that the only place to shelter is a supermarket close by. If this person enters the supermarket, he will do so to be protected from the bad weather, not to buy anything. As long as he will stay in the supermarket he will be dry – at least he will not get wetter. Now, what will happen if the supermarket closes and the bad weather continues? Since he will have to leave the shop, he will have to make up his mind which check-out queue he will join. Confronted with that choice, most likely he will select the longest queue in order to stay dry as long as possible. In making that decision, the quality of the cashier, the decoration, the range of products or any other aspect of the shop becomes irrelevant. The situation of an asylum seeker resembles this metaphor very closely. The ultimate motivation of an asylum seeker is safety. If confronted with an apparent choice of destination countries,[36] given a high degree of uncertainty whether he will make a chance to get a residence permit, the country that has the largest backlogs becomes interesting. To be more precise, a long queue implies a long delay before a rejected asylum seeker might get back to his travel agent; thus, a long delay is 'good for business' (of the travel agents). The idea that the quality of public care offered by a country to asylum seekers is a predominant factor in the selection process of destination countries is, for these reasons, invalid.

Another aspect of the quality of care relates to the quality of *societal* care. Next to the official treatment of asylum seekers, there is a certain image held by the general public. This image is predominantly 'built' by the representation of the (political) discussions in the media. In this model the assumption is made (loop B2) that thinking about asylum seekers by the general public is influenced by this image, and ultimately influences the (physical) treatment of asylum seekers. In Germany this has led to the violent circumstances, as mentioned in section 3, and the lowering of the attractiveness of Germany as a country of destination, generating an overall increase of the inflow in other countries, such as The Netherlands.

The B3 loop relates to the actual expulsion of rejected asylum seekers, another measure to deter future asylum seekers. Most receiving countries, however, do not expel refused asylum seekers until their request has passed all possible stages of review and appeal. And if all possible legal means are exhausted, the fact remains that the actual expulsion hardly ever occurs. This implies that the B3 loop only exists in theory and has, up until now, no practical meaning. Together, these circumstances generate backlogs and increasing average cycle time, which, again, raises the attractiveness, and constitutes the reinforcing loop of R4.

4.1.2 Production

The loops R6, R7, B8 and R9 refer to the work pressure and the extension of the productive staff. These loops are based on the stocks and flows diagrams presented in the work of Sterman (2000) and do not have any atypical or unknown structure. A remark, however, has to be made about the R5 loop. This loop represents one of the

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36 In practice, most destination countries are selected by so called travel agents. The effect, however, is the same. Travel agents benefit by non-returning customers.

measures taken: speed up the production. Normally, this option, together with the willingness to make more hours and the ability to decrease the time spent per task, is contained in the loops on work pressure. This R5 loop, however, has another meaning. It refers to the situation that speeding up the production also has an effect on the accuracy and the number of errors made. Within a legal context this is essential, since the occurrence of errors implies an increase of protests against these alleged errors and an increase of procedures leading to an increase of existing backlogs.

The remaining loops (B10, R11, R12, B13 and R14), also relate to the production, yet they do so in a peculiar way. In order to clarify these loops I need to go back to the RMoB as shown in figure 4.

4.1.3 Reorganisation and changing legislation

The RMoB has a number of characteristics. First, there is a lot of oscillation. Although this may look arbitrary, only caused by coincidence, an analysis of this oscillation reveals the existence of a season effect with a cycletime of exactly 12 months. The reasons for this repeating effect may be found in a number of considerations relating to the accessibility and passableness, or availability, of certain travelling routes in different seasons.[37] Needless to say, that this oscillation autonomously creates varying queues and calls for additional production capacity if compared to a yearly equally distributed inflow.[38]

Second, the RMoB shows a number of distinct peaks. Again, these peaks might be coincidental and just 'noise' in the data stream. The Dutch inflow peaks, however, coincide with major revisions of the Dutch Aliens Act.[39] What happens is that the inflow shows a firm increase (a peak) in the year before implementation and a smaller decrease afterwards, resulting in an overall increase.[40] The explanation for this is referred to as the 'slammed door effect'. In case a certain stricter regulation is announced, one can expect that a number of people, who already had decided to call upon this regulation, will do so, if possible, somewhat earlier under the current apparent less stricter regulation. Consequently, the number of applicants, right after the new regulation coming into force, will drop. This 'slammed door effect' (showed in loop R12) explains the sharp increase and subsequent fall of the inflow around the implementation of (stricter) legislation. It should be noted that the previously mentioned German Connection (B2 loop) 'started' in the same period in which one of the major revisions of the Dutch Aliens Acts was implemented. The combination of these loops (B2 and R12) caused the remarkable size of the peak. All this, however, does not fully account for the aggregated increase over the whole period. In order to explain this part of the RMoB, the remainder of the loops comes into the picture.

The implementation of new or revised legislation resembles to a certain extent the implementation of a new working method: a reorganisation. In general, a reorganisation causes a certain decrease in time available and an increase in handling time lowering the production. People have to learn changing their routines. Most of the time these production restraints are kept within reasonable margins due to a certain market

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37 The availability only of yearly data over a number of years for some countries, causes the graph in figure 1 to look like a stairway. It also prevents the verification whether the season effect also exists for Europe as a whole. Data on the inflow in The Netherlands are montly data as of 1983. Before that there are quarterly data.

38 The season effect has been implemented in the model using a cosinus function as a multiplier.

39 See note 18.

40 References to numbers are meant to be percentages related to the European total.

mechanism. Waiting too long implies a decrease in sales, a loss of market share and eventually a possible bankruptcy. In a legal domain of residential permits, however, one of the parties involved holds a monopoly and is not affected by this market mechanism. In such a case, the pressure to get back to the original or even higher completion or production rate solely originates from societal and political pressure. As a consequence, reorganisations in a legal context (loops B13 and R14) take up considerable time.

So far, I have indicated the loops on reorganisation and the *planning* of new or revised legislation. Loops B10 and R11 are concerned with the actual *implementation* of legislation. In short, changing legislation causes two things. First, a change of legislation not only introduces new legislation as of a certain date, abolishing the old legislation, it also introduces for a particular period of time a number of transitional provisions. Second, new legislation implies new legal questions that have to be answered by officials deciding on the submitted requests. Now, it must be kept in mind that answering legal questions has nothing to do with searching in a legal 'reference manual'; it has nothing to do with solving a mathematical equation. Yet, it has everything to do with interpreting the rules, which can be done in several ways.[41] That means that judges will be appealed to in order to clarify the indistinctness of the new rules until there is 'enough' case law.

Overall, new legislation almost immediately increases handling time decreasing production. A cautious estimate on the period of time involved between the implementation of new legislation and the point at which handling time is at its original level, amounts up to 3 or 4 years. This also means that it will take an additional period of time before production will become larger than in the period of the former legislation. And to make things worse, the gain of changing legislation will be totally lost whenever this legislation will be changed again. Changing too frequently and too quickly leads to the opposite of the intended result. Notably these change-of-legislation loops cause a decrease of production and an increase of backlogs ensuring a persistent presence of political pressure to 'do something about it'.

4.2 Stocks and flows

Figure 3 on the procedural routes may serve as an example for the stocks and flows diagram (on asylum requests) used in the model. The limited space in this paper does not allow me to show all relevant details. Therefore, only a simplified version of the S&FD is showed in figure 5.[42]

The actual model contains a chain of consecutive stocks each having a through-flow and an exit flow. The distinction between queues and conveyors facilitated the modelling of both the exit flows during waiting time and the exit flows after handling the request. Since Ithink – as a software modelling tool – allows the calculation of cycletimes for every procedural route between the entrance point and each of the exit points, the weighed average cycle time [mean CT] is used as an indicator for the [relative attractiveness of The Netherlands].[43] This factor is then used in combination with the [normative inflow in The Netherlands][44] and the total absolute [inflow in Europe] to calculate the actual [inflow] per month of the Dutch asylum system.

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41 By principle, a question can only be a *legal* question if it has as least two justifiable answers.

42 The elements within the S&FD are indicated in the text between [brackets].

43 In stead of the absolute size of the backlogs.

44 4%.

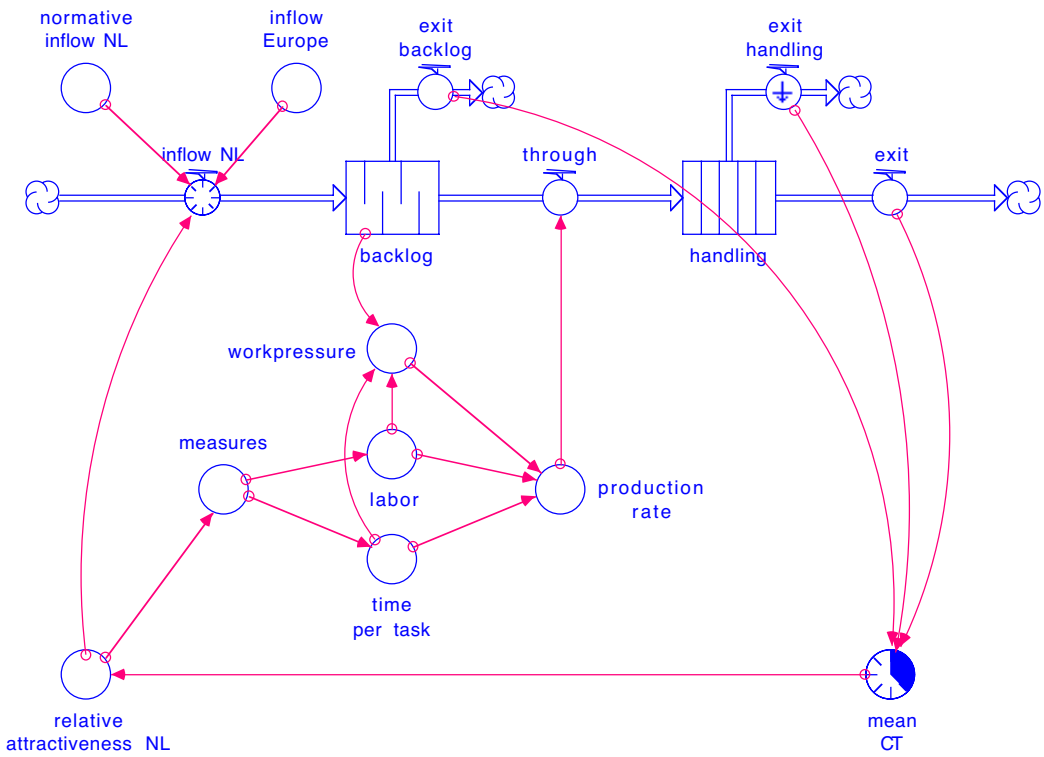

Figure 5 Simplified version of S&FD

The element [measures] is treated in more detail in a number of separate frames of S&F influencing the [time per task] and the net [labour].[45] Likewise, the (effect of) [workpressure], [labour] and [time per task] is dealt with in detailed frames generating the (maximum and potential) [production rate]. Also, it should be noted that the actual model contains separate frames of S&F regarding the Justice department (notably the Immigration Service) and the magistracy (regular courts and courts of appeal).[46]

5 Simulation

This study reports on the very first attempt to create an overall view of the Dutch asylum procedure in order to get hold of the possible dynamic relations causing the problematic RMoB. Since the method used is relatively unknown – particularly to those involved in asylum policymaking – I chose to elaborate the domain in great detail. After all, the objective of research was threefold: building confidence in the method, creating credibility of the model and an attempt to convince of its unorthodox – or counter intuitive – conclusions, or policy implications.

45 In accordance with Sterman (2000, p.565).

46 The modelling of legal aid and other actors could be left out, since in any part of the procedure these actors had to wait on activities of either the Immigration Service or the magistracy.

5.1 Tests

In addition to discussions with domain experts, keeping in mind the explicit warning of Sterman on questions-model-users-should-ask-but-usually-don't,[47] I tested the model extensively, performing all the tests described by Forrester & Senge.[48] Not only this implied a time-consuming effort changing and rerunning the model with various parameter settings, I also experienced that this process of 'validation'[49] quietly and almost unnoticed led to a very high degree of complexity diminishing most of the alleged usefulness and laboriously built confidence. The practice of model building and testing proved to be a question of balance: any attempt to increase only utility, complexity or confidence beyond reasonable doubt (i.e. soundness), ended up in a dramatic fall of the other two. Sterman (2000) made it crystal clear that 'validation and verification are impossible'. Perhaps, legal practice might enrich the terminology used on this issue introducing the term of model-judgement (shown in figure 6).

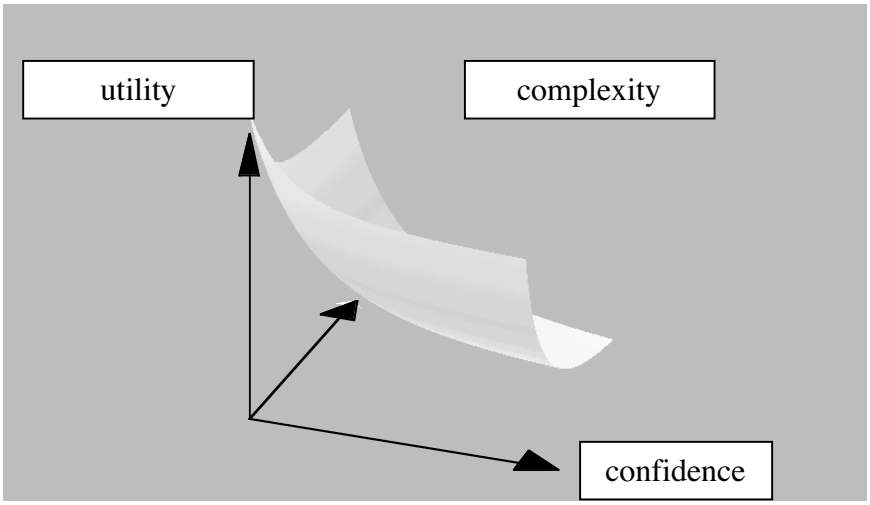

Figure 6 3D balance of model-judgement

The serious attempt to perform *all* tests resulted in the conclusion that only a couple of tests were infeasible. The other tests were passed successfully. Amongst the unfeasible tests is a (three piece) boundary-adequacy (structure, behavior and policy) test.[50] The unfeasibility of this particular test, lies in an assumption concerning the exclusion of the factor 'nationality' in the model. That is to say, the model does *not* include any reference to nationality or language of asylum seekers, due to a simple lack of necessary data. These missing data, however, could have been essential. In order to establish the soundness of this assumption, given the infeasibility of the boundary-adequacy test on this item, I tried another approach. Extensive research in the available literature allowed me to conclude that the construction of additional structure covering the concept of country of origin was unnecessary, provided that the distribution of nationalities of asylum seekers over the receiving countries was sufficient.

The other infeasible test is the system-improvement test. Forrester & Senge (1980) state on this: *The ultimate test of a system dynamics model lies in identifying policies that lead to improved performance of the real system*. Although essential, it is,

47 Sterman (2000, p.851).
48 Forrester & Senge (1980, p.210-211).
49 See on the meaning of the word 'validation' in particular Forrester & Senge (1980) and Sterman (2000).
50 As refered to in footnote 46, the modelling of legal aid and others could be left out.

yet, too early to think of any practical implementations. Not only because this research has just finished, but also because the practice of asylum policymaking is a very complex and delicate one.

5.2 Results

Although the model contains a large number of variables and assumptions, which may be questioned,[51] the reproduction of the RMoB is striking. Figure 7 shows the result of a model simulation representing a graph of the RMoB (#2) and the inflow of the model (#1).[52]

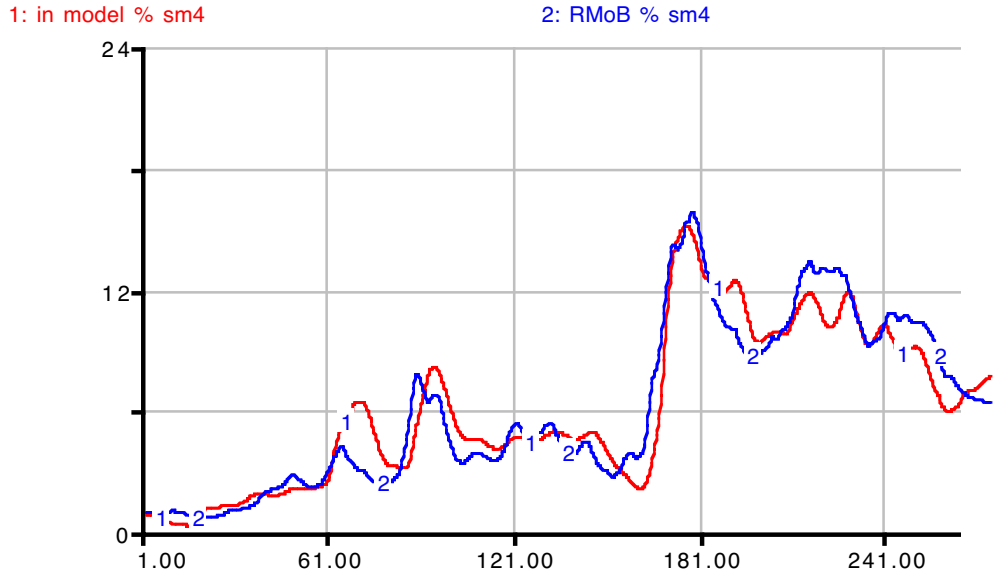

Figure 7 Model simulation of % inflow (1) and the RMoB (2) per month (Jan. 1980 – Dec. 2001)

A second result is displayed in figure 8 in which the cumulative absolute inflow (#1) almost coincides with the cumulative absolute RMoB (#2). It shows that over a period of 22 years (265 months) the model only deviates from the RMoB for less than 2%. Other tests show a likewise representation of the developments of backlogs[53] and the size of the (productive) labour.

The results presented so far, are related to the RMoB, i.e. the historical inflow, taking into account historical settings on, for instance, the maximum of (allowable and affordable) labour and the dates on which legislation was changed. In the model I have added a number of switches allowing the user to reformulate this historical policy: what would have happened if ... ? This revealed, for instance, that the measure that would have had the most 'desirable' effect was the simplest: increase firmly, but not excessive, the factor labour (larger budget scenario).[54]

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51 This was mainly done in the discussions with domain experts.

52 For convenience the lines in the graph are smoothed.

53 The reference mode on backlogs could only be estimated over the period until 1990. After 1990 some information is reported on their sizes.

54 This has only recently been done by the Dutch Immigration Service. Due to the far-reaching protection of public servants (contracts of employment are for an infinitive period), it still is very difficult to lay off people. As a result, the extension of the workforce was thought of as too expensive and temporary employment agencies were used.

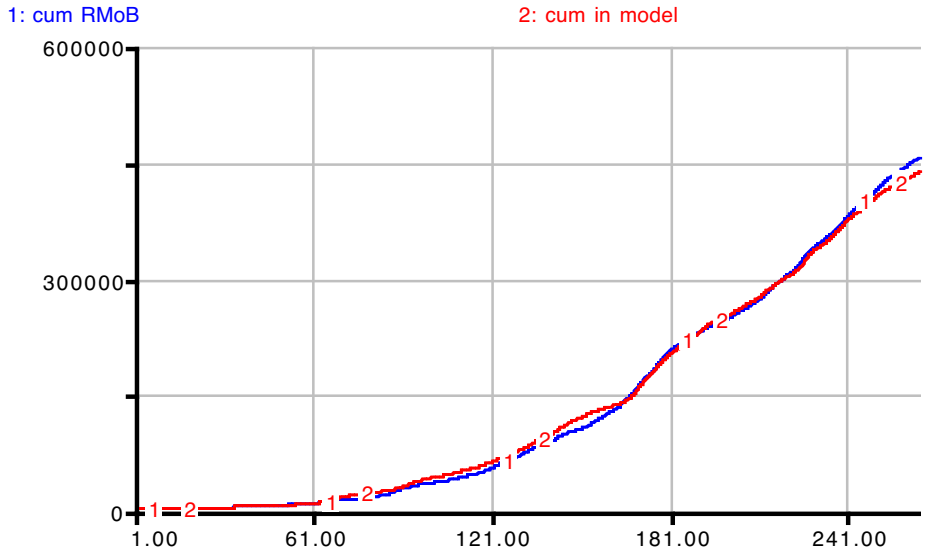

Figure 8 Model simulation of cumulative absolute inflow (Jan. 1980 – Dec. 2001)

The accompanying graph shows an early and more flexible adjustment of the size of the staff (figure 9) generating over the whole period a smaller cumulative inflow.

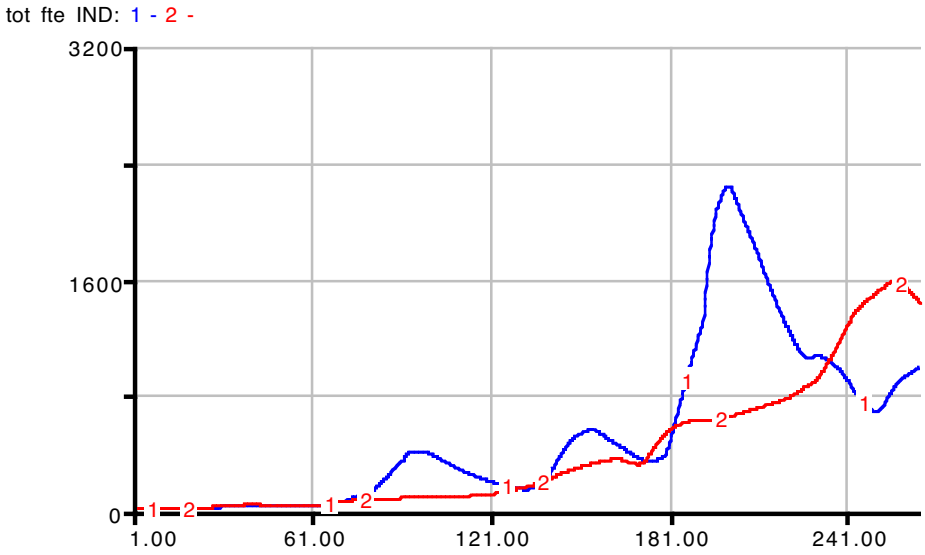

Figure 9 Model simulation of larger budget of fte's (#1) and RMoB of fte's (#2)

Due to this 'early' change of labour size, the production capacity was 'enough' to cope with the inflow, generating smaller backlogs, shorter cycletimes and lower perceived attractiveness, leading to a lower cumulative inflow[55] over the whole period (figure 10).

55 Estimated: 25 % less inflow.

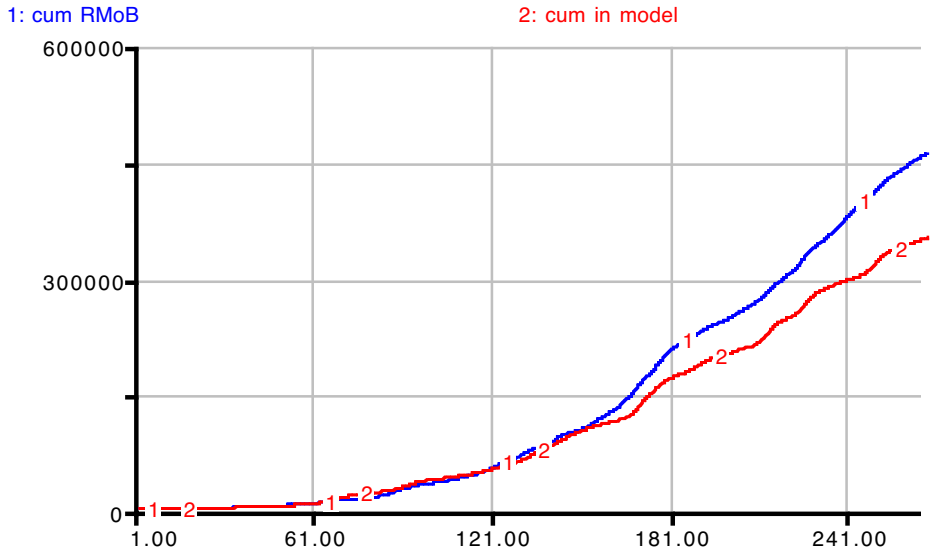

Figure 10 Model simulation of RMoB of cum. inflow (#1) and cum. inflow with larger budget (#2)

It goes without saying that this larger budget scenario resulting in a more flexible size of the staff has its own price. As can be seen in figure 9 the size of the staff only gets substantial smaller at the end of 1999 (t=235). The accompanying price tag depends on a number of factors such as the salaries and the ability to hire and lay-off personnel. A rough estimation of the difference in salary costs only is shown in figure 11.[56]

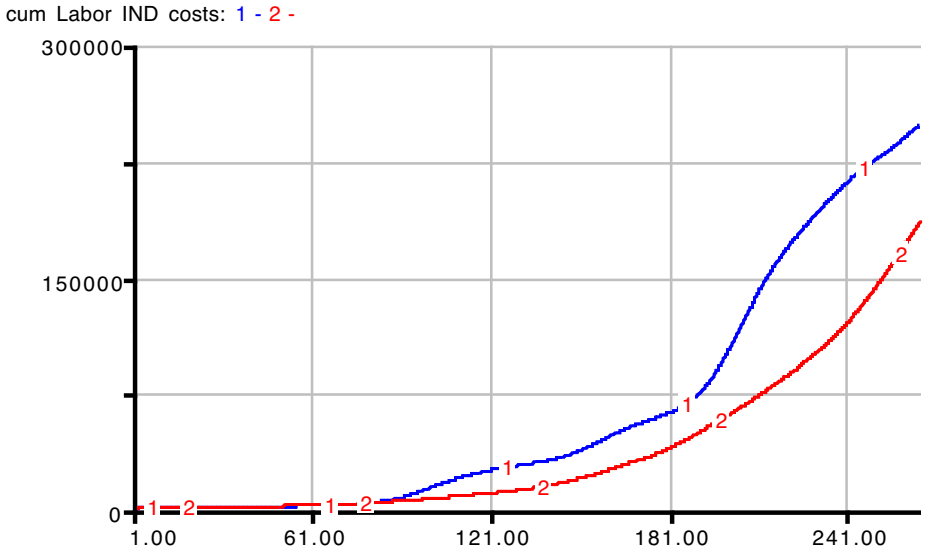

Figure 11 Model simulation of total salary costs of RMoB (#2) and of flexible size (#1)

Along with this financial staff-only picture, it should be noted that the 'real' costs are far more difficult to calculate. Since that would include all types of costs such as the costs of accommodation.

Finally, I tried to model a so-called auto-policy-switch allowing the model to generate changes of legislation all by itself.[57] This feature is based on the concept of 'the

56 The size of costs is expressed in no further defined salary units. In order to resemble reality that salaries depend on seniority, the assumption has been made that (on average) trainees cost one salary unit, juniors cost one-and-a-half salary unit and seniors cost two salary costs unit.

57 Instead of changing at the predefined historical dates.

last drop makes the cup run over'. A reservoir is filled by the change of the rate of inflow (a second order derivative) and whenever a certain threshold is passed, a measure to change legislation is taken, the reservoir is emptied and after implementation the reservoir may be filled again.

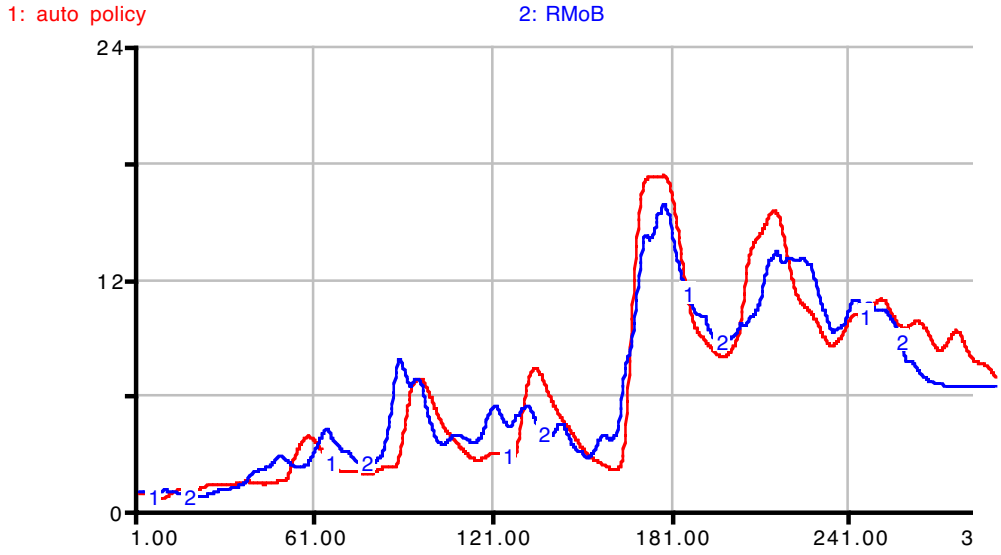

Figure 12 Model simulation of auto-policy

The result of a simulation of this auto-policy is shown in figure 12. The most peculiar aspect of this auto-policy graph is not the resemblance with the RMoB, but the actual suggestion that policy making in such a highly emotional and complex world of asylum policy *can* be modelled. This illustrates, again, that human decision-making may seem unpredictable but in fact it is not. It is the human brain itself that lacks the possibility of combining more than a couple of causal relations.[58]

Gathering the necessary data for this research was very much labour-intensive and time-consuming, due to, amongst other factors, a high degree of political delicacy of the asylum issue and government officials having an idea that information on this issue is supposed to be top-secret.

6 Some final remarks

One of the most important implications is that a change of legislation as a policy tool for reducing backlogs in the administration of justice is very much counter-productive. An interesting 'proof' of this was produced near the end of my research when, again, a new Dutch Aliens Act was implemented (April 2001, t=256). This happened whilst a structural decrease of the relative inflow in The Netherlands was noted. With reference to the 'slammed door effect', an incidental increase and subsequent decrease might have been expected during the announcement and implementation of a new act. However, the shift of the German-Dutch connection (of negative correlation) towards a German-British connection at the end of the nineties implies a more structural decrease. The combined behavior is manifest at the end of the graph in figure 4. The structural decrease of the inflow is temporarily interrupted, between the moment of planning and the actual implementation of the revised act. In other words, if the new Aliens Act

58 Bounded-rationality: Simon (1947). See also (a.o.) Hogarth 1987.

would *not* have been considered nor implemented, the inflow would have decreased even more. As a consequence, the decrease of the inflow – since 1999 – did not happen thanks to but in spite of this change of legislation.

Another implication is that most of the arguments articulated in so-called asylum-debates are based on quicksand and that the measures taken do not have the intended effect. The recent changes of legislation in the UK aimed at the deterrence of new asylum seekers, are accompanied by an increasing inflow in the UK.[59] Also, the discussion in Germany on the proposed new immigration act may have interesting links with the German inflow of asylum seekers.

The asylum procedure as such is in many respects a unique procedure, since the heart of the asylum request is about 'freedom of fear', involving one of the most important human rights: *Everyone has the right to life, liberty and security of person*.[60] Nevertheless, to a certain extent the dynamic problems concerning the administration of justice within the (Dutch) asylum procedure may be seen as an example for other legal procedures as well as a renewed perception of 'regular' public policy issues. If so, the domain of a system dynamic approach of public policy issues, such as health, environment, and social welfare, might be extended to the uncultivated area of legal dynamics.

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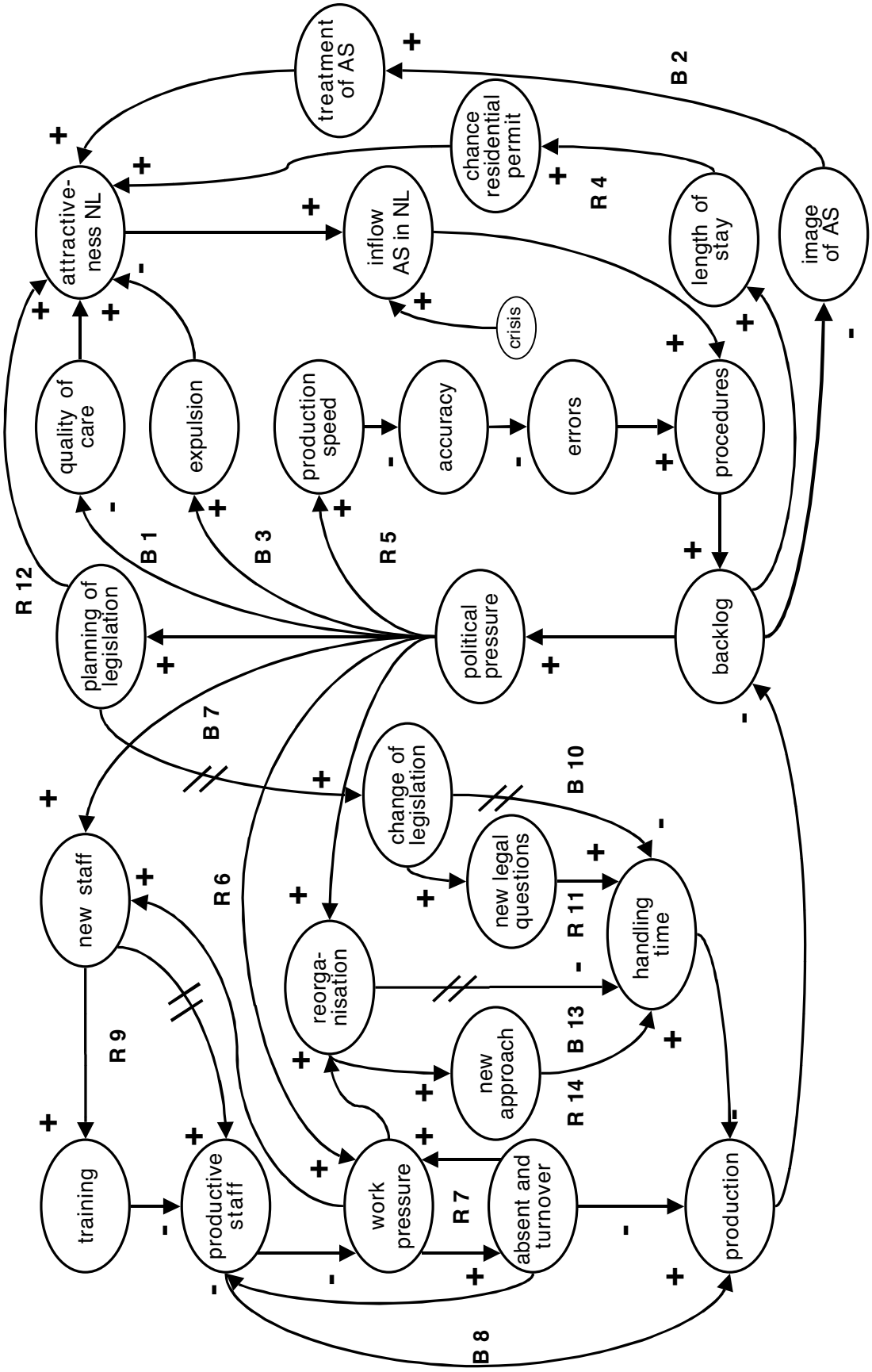

Figure 13 Causal Loop Diagram of the asylum procedure

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