Risk-Factor	Factors influencing the risk impact	**Risk value Propagation & Processing risk**	Comment
1. Structure and dynamics of the bovine, ovine and caprine animal populations			
(a) absolute numbers of animals per species and breed, alive and at time of slaughter;	A high sheep/cattle ratio could indicate higher potential for BSE. If ratio is > 1, assume risk increased to some extent (RF = 4). Population density could be an indicator of intensity of husbandry practices. Intensive husbandry would imply need to use concentrates due to shortage of grazing. Extensive husbandry would reduce incentive of using concentrates.	3 4 2 3 4	Some impact on Propagation risk, direct impact on processing risk.
(b) age distributions of animals per species and breed, sex and type;	A high average age could indicate a high average age at slaughter and hence point to a higher processing risk.	2 3 4	
(c) age distribution of animals per species and breed, sex and type at time of slaughter;	The likelihood of infectivity entering the food/feed chain increases with higher average age at slaughter: age<2, RF=1, age=2, RF=2; age=3, RF=3; age=4, RF=4; age>4, RF=5.	1 2 3 4 5	Some impact on Propagation risk, direct impact on processing risk.
(d) geographical distribution of the animals by species and breeds;	Indicator of intensity of husbandry. High local concentration points to higher exposure risk. If sheep and cattle are farmed in the same areas local sheep/cattle ratio might be significant higher (see 1a).	2 3 4	
(e) geographical distribution of the animals by husbandry systems, herd sizes and production purposes;	Another indicator for intensity of husbandry systems. Impact on risk as for 1a and 1d. Impact on risk could be increased through production purpose that could require additional protein supply for specific periods or permanent. Relevant for exposure-risk.	2 3 4	Some impact on Propagation risk.
(f) system of identification and capacities for tracing of animals.	A good identification system could help control any disease if it does occur and reduce processing risk. Without such a system it will not be possible to trace offspring of positive cases, so processing risk can not be reduced.	2 3	Some impact on processing risk..
Overall Risk Factor	Note: This should NOT be an arithmetic average of the component factors.	1 2 3 4 5	

Risk-Factor	Factors influencing the risk impact	Risk value	Comment
2. Animal trade			
(a) imports and exports;	Imports of live animals from any country with confirmed BSE incidence would indicate a certain risk that infective animals have been imported. In assessing significance of imports it may be important to consider the specific regions of countries from which imports originated. Relevant for processing risk at time of slaughter of imported animals.	3 4 5	Indirect impact on Propagation risk, direct impact on processing risk.
(b) trade within the geographical area;	Only relevant if one assumes sub-regions with remarkably different BSE-risk	3 4	
(c) imports of embryos and semen;	Imports from any country with confirmed BSE incidence could point to a remote risk of imported BSE. However, the SSC stated that the risk of transferring BSE via Semen or Embryos is very small. It would influence the processing risk at the end of the life of the resulting animals.	3 4	
(d) use made of imported animals, embryos or semen;	Slaughtering imported animals at young age shortly after import would reduce the processing risk because their infective load could anyway not be very high. If animals kept alive for a long period (breeding cows, dairy) their BSE-load could be much higher. Also, these are likely to be high value animals for breeding purposes and used for embryo and semen production. (See 2c above). This could increase the processing risk through vertical transmission (small risk).	2 3 4	Indirect impact on Propagation risk, direct impact on processing risk.
(e) mechanisms used by slaughterhouses to identify animals and their origins, as well as data from these procedures.	Relevant for surveillance and monitoring effectiveness. BSE cases may be identified at slaughterhouses if clinical condition brought on by stress of travel etc. See also 1 (f). Good back-tracing would allow eliminating animals exposed to similar conditions as the cases and hence to reduce the processing risk.	2 3	Direct impact on processing risk.
Overall Risk Factor	Note: This should NOT be an arithmetic average of the component factors.	1 2 3 4 5	

Risk-Factor	Factors influencing the risk impact	Risk value	Comment
3. Animal feed			
(a) domestic production of Meat and Bone Meal (MBM), and its use per species and husbandry system (in particularly the proportion of the domestically produced MBM fed to bovine, ovine and caprine animals).	If (ruminant derived) MBM is used to supplement ruminant feeds to any extent this would imply a high risk factor (RF = 5). If ruminant MBM is used for any feeds (e.g. pig and poultry) there is the possibility of cross contamination (RF = 4). If unsafe processes were used for rendering this would increase the risk (see 7 (a)). This factor is critical for the exposure risk. A complete ban (100%) would eliminate the most important transfer vector and significantly reduce the-Cattle exposure risk.	1 2 3 4 5	Direct impact on Propagation risk.
(b) imports of MBM, specifying country of origin, and its use per species and husbandry system (in particularly the proportion of that MBM fed to bovine, ovine and caprine animals);.	MBM imports from any country with confirmed BSE incidence would increase the risk, feeding it to bovines would increase it further. Importing MBM from BSE-free countries could slightly reduce the exposure risk through a dilution effect.	2 3 4 5	Direct impact on Propagation risk.
(c) exported MBM, specifying country of destination.	Exporting MBM might reduce the risk but could increase it in the receiving country (in particular if ruminant based MBM is exported or if MBM made from high-risk material is imported). **Ensure information is passed to file of receiving country.**	2 3	Direct impact on Propagation risk.
Overall Risk Factor	Note: This should NOT be an arithmetic average of the component factors.	1 2 3 4 5	

Risk-Factor	Factors influencing the risk impact	**Risk value**	Comment
4. Meat and bone meal (MBM) bans			
(a) complete description;	A convincing MBM-ban reduces significantly the exposure risk and hence the propagation risk. Here the input of the structure of the ban on the risk shall be assessed. A well constructed ban has higher likelihood of effective implementation and would hence reduce the risk, and vice-versa.	2 3 4	Direct impact on Propagation risk.
(b) dates of introduction;	An MBM-ban will quickly reduce the exposure risk to some degree but it will take about two years (or more) until it is fully effective The impact on the processing risk will be further delayed by the normal incubation time. Assess risk in relation to implementation date: 8 years ago: RF = 1 (low exposure and processing risk) 4 years ago: RF = 2 (low exposure r., small impact on processing r.) 2 years ago: RF = 3 (lower exp.-risk, no impact on processing r.) *Note: not having an MBM-ban only increases the risk if MBM is fed to ruminants but that risk is already taken into account in RF3.*	1 2 3	Direct impact on Propagation risk.
(c) actual implementation, policing and compliance figures;	Good, convincing implementation reduces the risk. Need to demonstrate firm evidence that the ban has been implemented effectively, with good controls and procedures to ensure that it remains effective. An inefficient implementation counteracts the risk reduction potential of the ban: RF=4	2 3 4	Direct impact on Propagation risk.
(d) possibilities of cross-contamination with other feed.	High likelihood of cross-contamination would increase the risk. Need to check for potential for cross contamination both during production and during transport and distribution. Cross contamination will be possible if feed mills are producing pig & poultry feeds using MBM as well as bovine and ovine feeds, in particular if the same lines are used.	1 2 3 4 5	Direct impact on Propagation risk.
Overall Risk Factor	Note: This should NOT be an arithmetic average of the component factors.	1 2 3 4 5	

Risk-Factor	Factors influencing the risk impact	**Risk value**	Comment
5. Specified bovine offal (SBO) and specified risk materials (SRM) bans			
(a) complete description;	A better constructed ban has higher likelihood of effective implementation. The reduction of the BSE-load possibly entering the food and feed chain increases with the number of SRM/SBO excluded. The CNS alone contains about 90% of the infective load of a clinical BSE-case. Banning CNS from food only would **not** reduce the exposure risk (exp. of ruminants to BSE). Assess the risk as follows: No SBO/SRM-ban or only banned from food: RF = 3 (no impact on risk). Only brain banned from food and feed: RF = 2 (lower processing risk) CNS banned from food and feed: RF= 1 (significantly lower proc.-risk) Note: The non existence of an SRM-ban can not increase the risk above the existing level but an effective SRM-ban can reduce an existing risk.	1 2 3	Direct impact on Processing risk.
(b) dates of introduction;	Assess risk factor as in relation to period since introduction: Less than 2 years ago : RF=3 (no impact on current risk) 2 to 3 years ago: RF = 2 (some impact) more than 3 years ago: RF=1 (significant impact)	1 2 3	Direct impact on Processing risk.
(c) actual implementation, policing and compliance figures.	Good, convincing implementation reduces the risk. Need to demonstrate firm evidence that the ban has been implemented effectively, with good controls and procedures to ensure that it remains effective. An inefficient implementation counteracts the risk reduction potential of the ban: RF=4	2 3 4	Direct impact on Processing risk.
Overall Risk Factor	Note: This should NOT be an arithmetic average of the component factors.	1 2 3 4 5	

Risk-Factor	Factors influencing the risk impact	Risk-value	Comment
6. Surveillance of TSE, with particular reference to BSE and scrapie			
(a) methodologies and programmes of surveillance & recording of clinical cases of BSE and scrapie, awareness training for farmers, vet., Supervis. bodies and authorities;	The surveillance as such can not increase the risk but is essential for controlling it. A bad surveillance system would not reduce an existing risk, a good one would identify cases and even suspect cases that subsequently would be prevented from entering the food/feed chains. The impact on the risk could therefore be neutral, (RF=3) or reducing it to some extent (RF=2) or significantly (RF=1). Very bad surveillance could allow BSE cases (at least suspects) being processed and would increase the processing risk.	1 2 3 4	Some impact on Propagation risk, direct impact on processing risk.
(b) incidence of neurological disorders in which TSE could not be excluded on clinical grounds in any animal species;	The number and type of brains analysed annually in appropriate laboratories is a good indicator for the capacity of the system to identify BSE.	2 3 4	Some impact on Propagation risk, direct impact on processing risk
(c) incidence of lab confirmed cases of BSE and scrapie;	Risk is proportional to incidence in a given surveillance system. It should be realised that for each confirmed case about 10 not-clinical cases may exist. Therefore incidence >100/mio); RF=5, incidence <100)/mio; RF=4, no incidence; RF=3	3 4 5	- " -
(d) distribution by age &, place, and countries of origin of cases;	Cases after the bans are an indication of implementation failures (RF=5). A low age of cases might indicate that animals were being exposed to higher than normal doses, implying a higher risk factor (RF=4). If all cases were imported animals (RF=3).	3 4 5	- " -
(e) incentives for reporting cases, compensation and reward schemes;	Reporting of suspect cases is less likely if compensation is below market value (no reduction of risk; RF=3). If a herd culling is in place effective compensation needs to cover loss of income & value of animals (reduction of processing risk; RF=2).	2 3	- " -
(f) Method of lab. Conf. and recording of suspect cases of BSE and scrapie;	Better methodologies -> better surveillance -> lower risk. Good laboratory practices would combine other methods with histopathological verification (alone it would miss about 15-20% of cases).	2 3 4	- " -
(g) BSE and scrapie strains	Relevance ?	3	
(h) existing systems or current plans for targeted active surveillance.	Active surveillance would increase the value of incidence figures and support BSE-freeness.	2 3	- " -
Overall Risk Factor	This should NOT be an arithmetic average of the component factors.	1 2 3 4 5	

Risk-Factor	Factors influencing the risk impact	**Risk value**	Comment
7. Rendering and feed processing			
(a) all rendering and feed processing systems used;	Only batch (133/20/3 or better); RF = 2; Mixture of batch (133/20/3) and Continuos; RF 3 to 4, depending of relative weight of each type; Only continuos system, but with reliable (133/20/3 or equivalent); RF = 4; Other systems not in compliance with (133/20/3) or no reliable information; RF = 5	2 3 4 5	Strong impact on propagation risk.
(b) nature of the records of rendering and processing plants;	Does not change the risk but important for the reliability of the information under 7a. Unreliable records increase the RF of 7a by 1.	2 3 4	
(c) quantitative and qualitative parameters of MBM and tallow production by each of the processing systems;	Refers to the same risk element as 7a but allows quantitative verification. The relation of outputs from the different systems is important for the risk.	2 3 4	Strong impact on propagation risk.
(d) the geographical areas from which the rendered materials originate;	Raw material from BSE-risk area: RF=4; Raw material from BSE-free areas could reduce the risk (diluting local risk-material): RF=2	2 3 4	Strong impact on propagation risk.
(e) the type of raw material used;	If SRMs and suspect TSEs (incl. SCRAPIE) are excluded, the risk is smaller: RF=2; if SRM is rendered at 133/20/3: RF=4; if SRM is rendered not in compliance with 133/20/3: RF=5	2 3 4 5	Strong impact on propagation risk.
(f) parameters on separate processing lines for materials from healthy and suspected animals;	If no separate processing lines, risk of cross-contamination high: RF=5, separate processing lines but within the same premises: RF=4; separate processing lines in different premises: RF=3	2 3 4 5	Strong impact on propagation risk.
(g) transport and storage systems for MBM or feed containing MBM.	Cross contamination may result from inadequate bulk transport systems.	2 3 4	Strong impact on propagation risk.
Overall Risk Factor	Note: This should NOT be an arithmetic average of the component factors.	1 2 3 4 5	

Risk-Factor	Factors influencing the risk impact	**Risk value**	Comment
8. BSE or scrapie related culling			
(a) culling criteria;	Complete culling of case-herds/flocks should include all offspring, cohorts and "in-contacts" (BSE & SCRAPIE: RF=2). Less complete: BSE RF=3, SCRAPIE RF=4 [Culling programme is likely to be more effective for scrapie than for BSE.]	2 3 -BSE 2 3 4 Sc	Impact on processing risk
(b) date of introduction of the culling scheme and of any subsequent modification;	The culling of the case-herds/-flocks would reduce the processing risk in the subsequent years, when the animals normally would be slaughtered. For BSE the likelihood for multiple infection within herds is small, therefore the effect of the culling on the risk also not very substantial. For SCRAPIE multiple infection of herds is normally the case and complete culling will have rather stronger impact on the processing and, due to horizontal transmission, the propagation risk. The impact increases with time since introduction. Assess risk factor as: Implemented since 5 years: BSE: RF = 2; SCRAPIE: RF = 2 Implemented since 4 years: BSE: RF = 3, SCRAPIE: RF = 3 Implemented since 3 years: BSE: RF = 3; SCRAPIE: RF = 4	2 3 4	Impact on processing risk
(c) animals culled (details as specified in point 1);		-	Impact on processing risk
(d) sizes of herds in which animals were culled.		-	Impact on processing risk
Overall Risk Factor	Note: This should NOT be an arithmetic average of the component factors.	1 2 3 4 5	

PART TWO: Risk-Tables

Indicate separately the impact on propagation and processing risk.

	Risk Factor	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02
Population	1a																							
	1b																							
	1c																							
	1d																							
	1e																							
	1f																							
	ONE																							
Trade	2a																							
	2b																							
	2c																							
	2d																							
	2e																							
	TWO																							

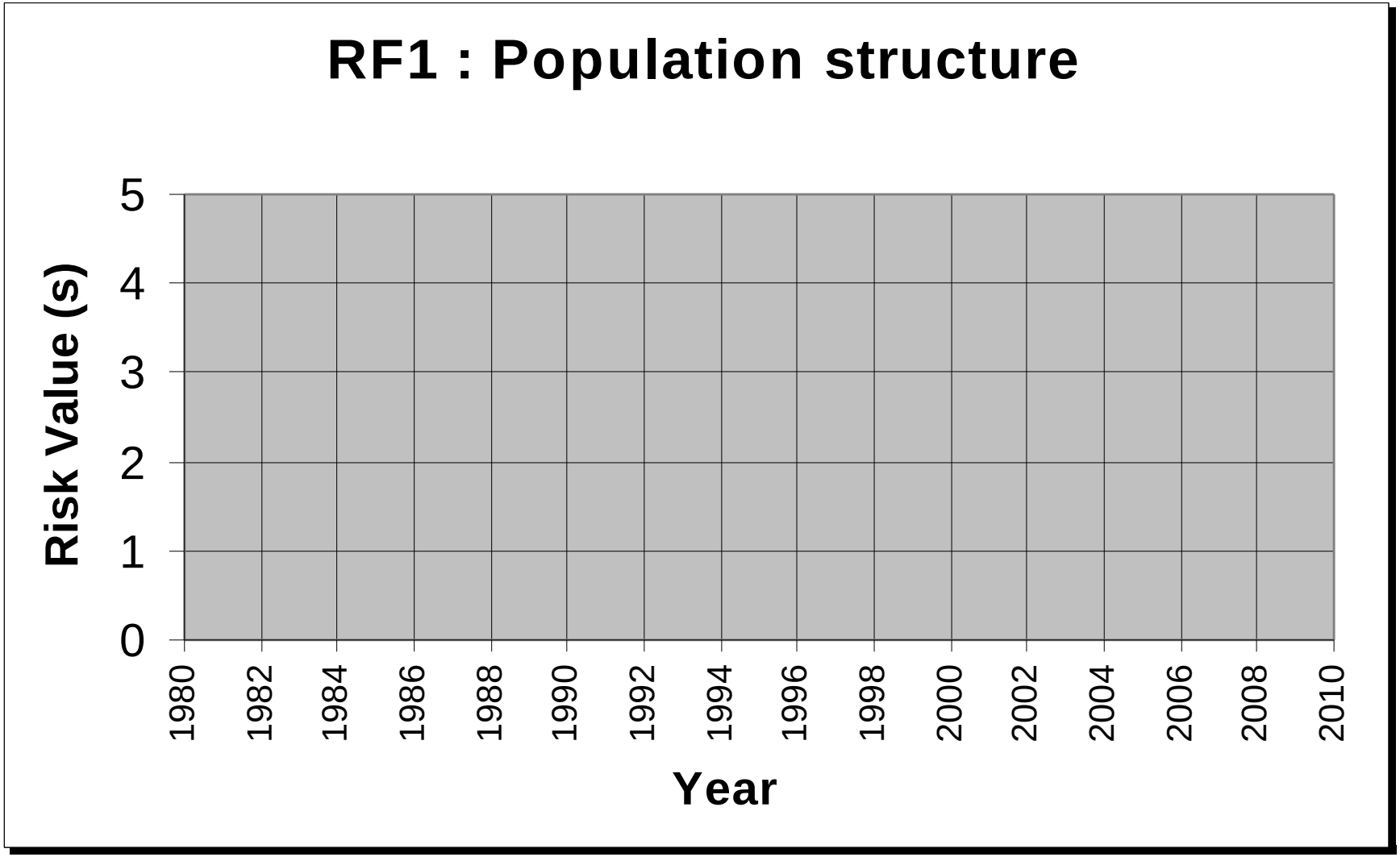
	Risk Factor	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02
Animal feed	3a																							
	3b																							
	3c																							
	Three																							
MBM Ban	4a																							
	4b																							
	4c																							
	4d																							
	FOUR																							
SRM-Ban	5a																							
	5b																							
	5c																							
	FIVE																							

	Risk Factor	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02
Surveillance	6a																							
	6b																							
	6c																							
	6d																							
	6e																							
	6f																							
	6g																							
	6h																							
	SIX																							
Rendering	7a																							
	7b																							
	7c																							
	7d																							
	7e																							
	7f																							
	7g																							
	Seven																							

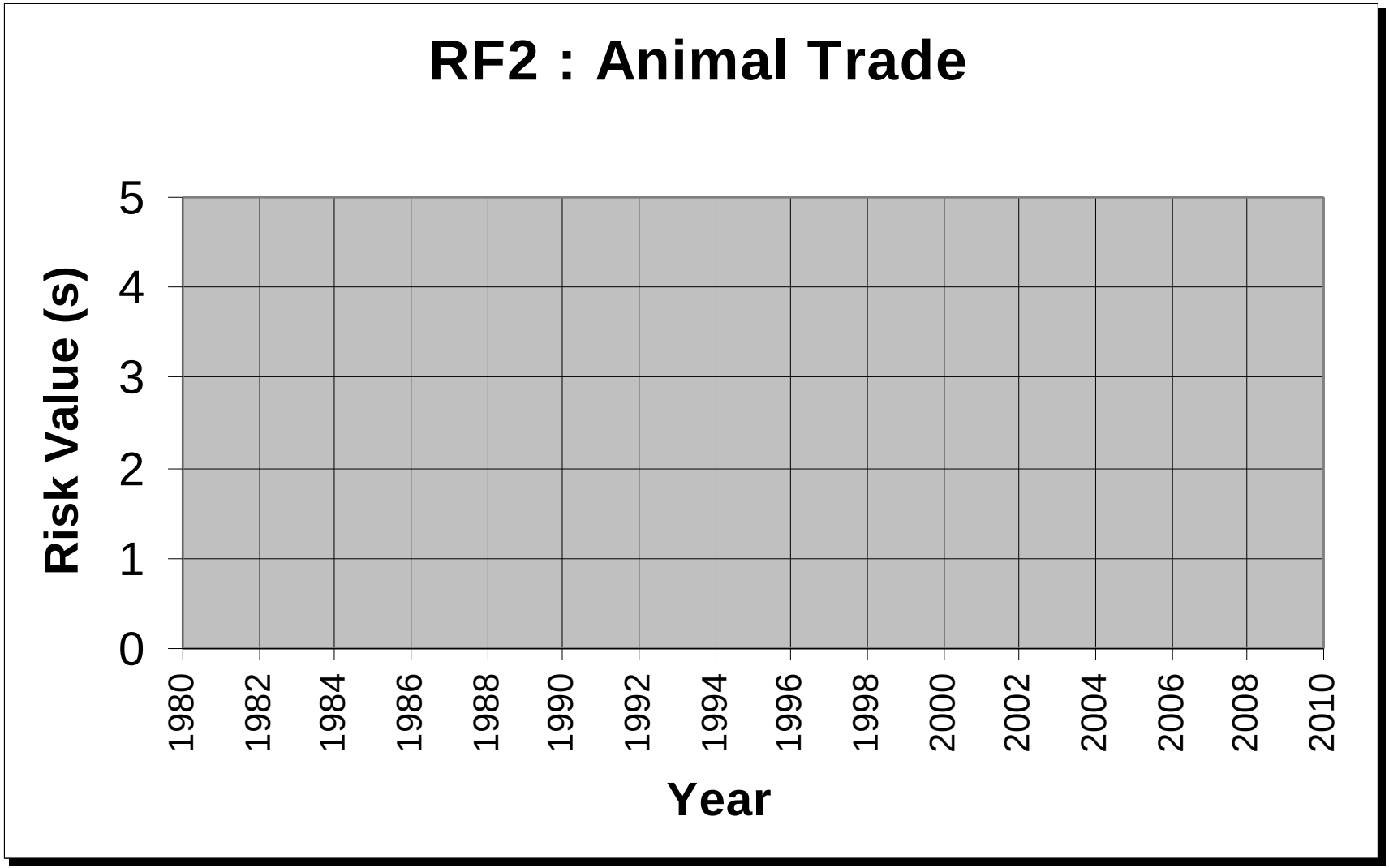
	Risk Factor	80	81	82	83	84	**85**	**86**	**87**	**88**	**89**	**90**	**91**	**92**	**93**	**94**	**95**	**96**	**97**	**98**	99	00	01	02
Culling	**8a**																							
	8b																							
	8c																							
	8d																							
	Eight																							
Overall Risk :																								

Part 3 : Graphical presentation of the development of the Risk-Factors over time

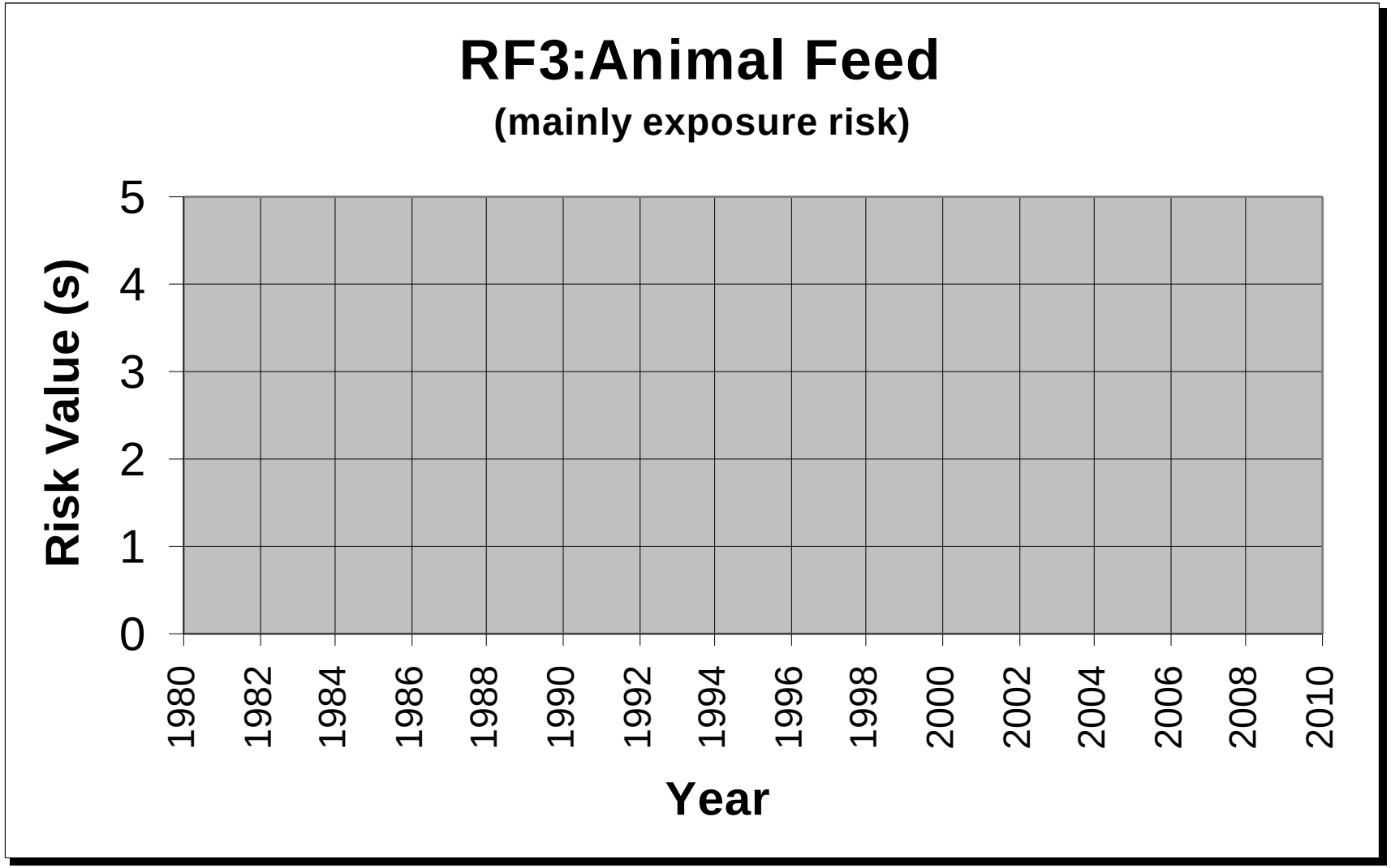
Note: plot the risk-values for the propagation risk and the processing risk separately



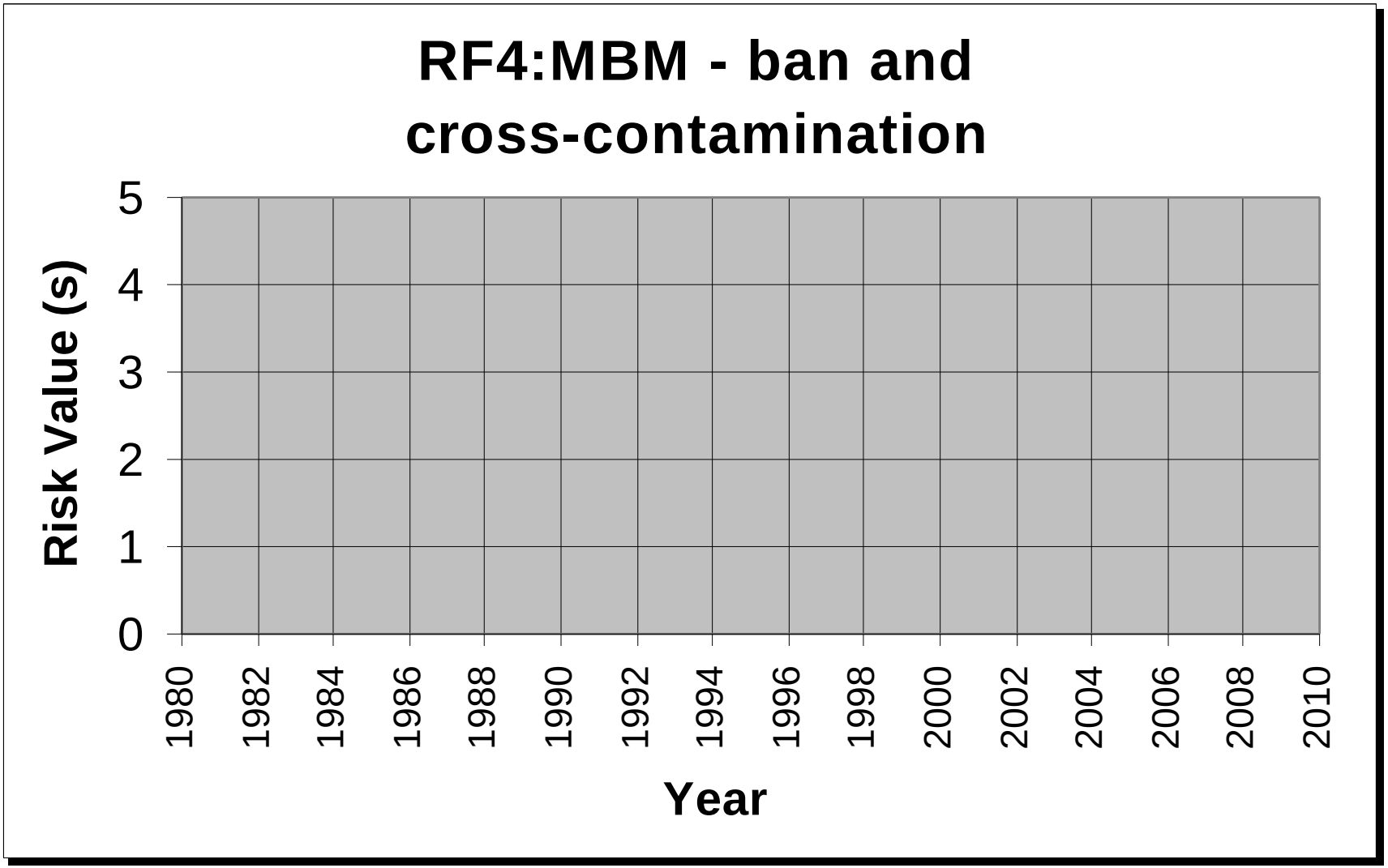
Note: plot the risk-values for the propagation risk and the processing risk separately



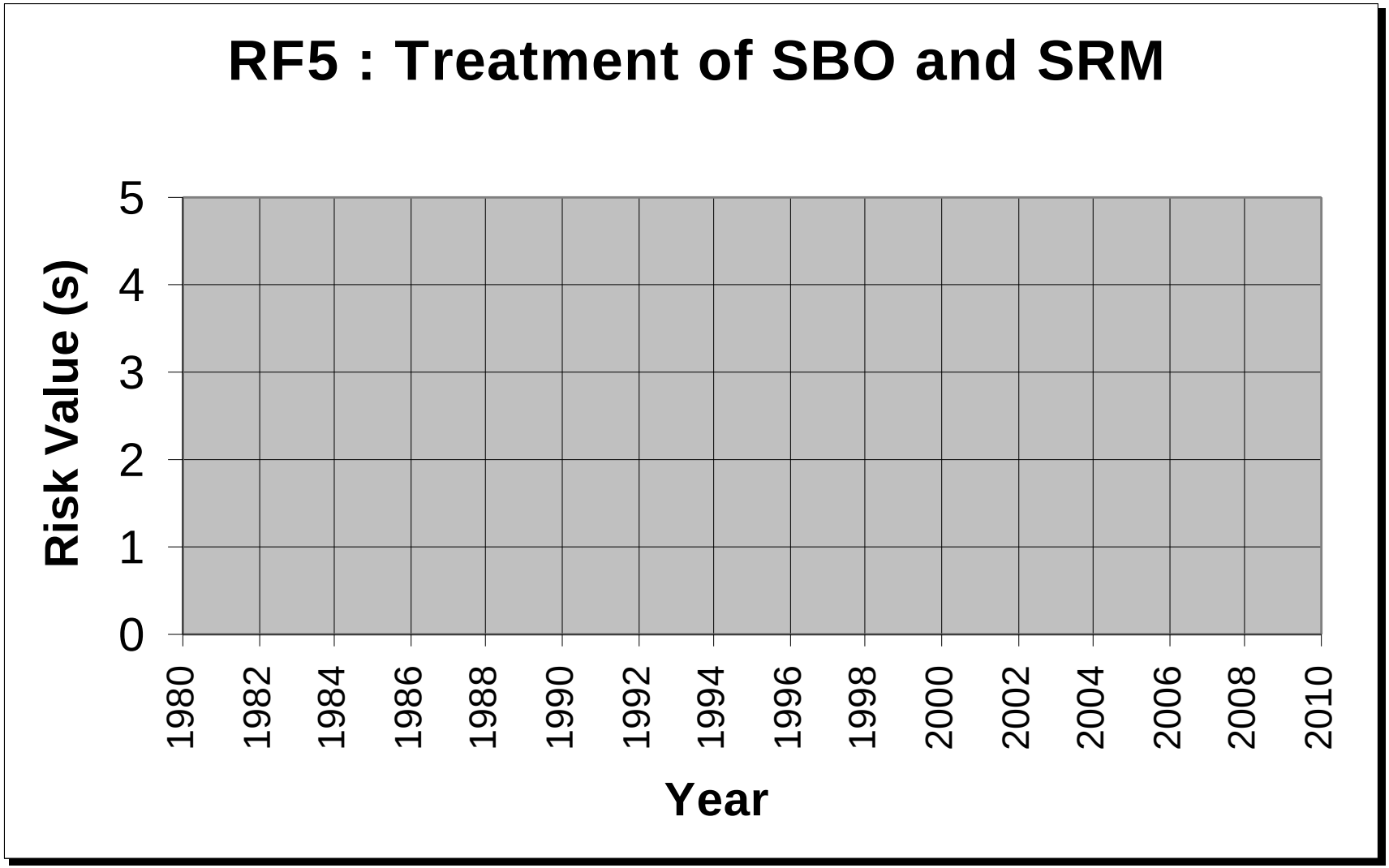
Note: plot the risk-values for the propagation risk and the processing risk separately



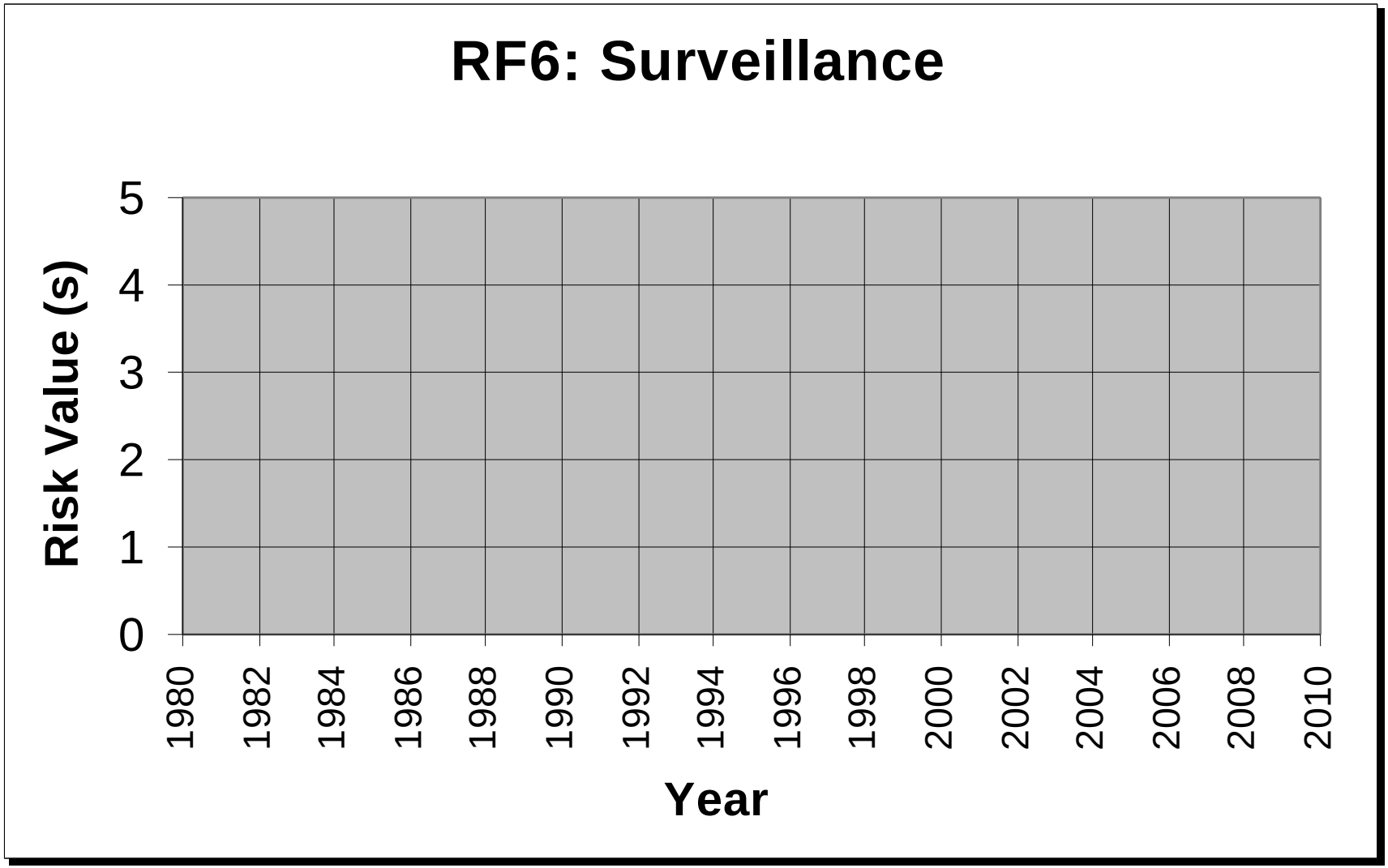
Note: plot the risk-values for the propagation risk and the processing risk separately



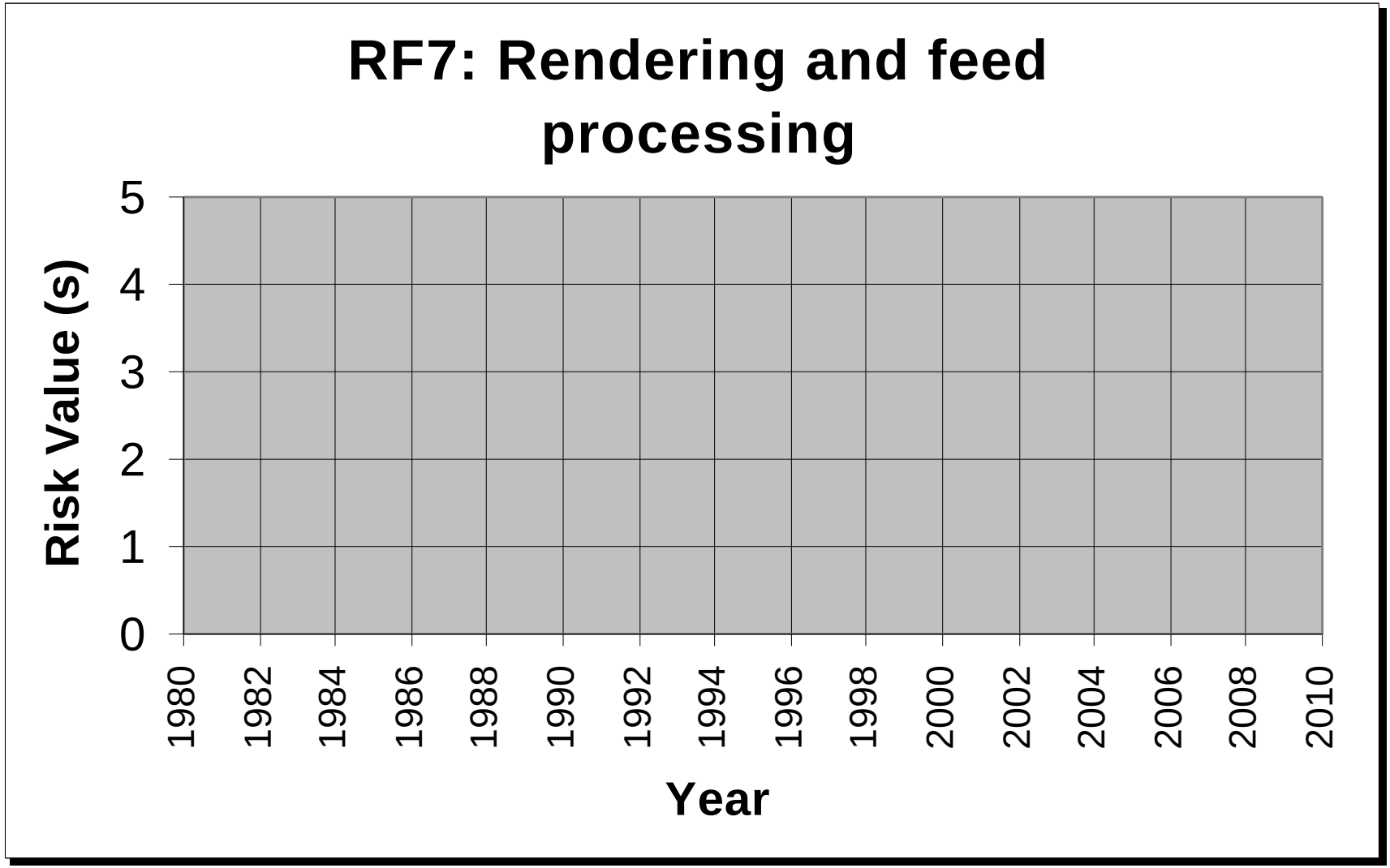
Note: plot the risk-values for the propagation risk and the processing risk separately



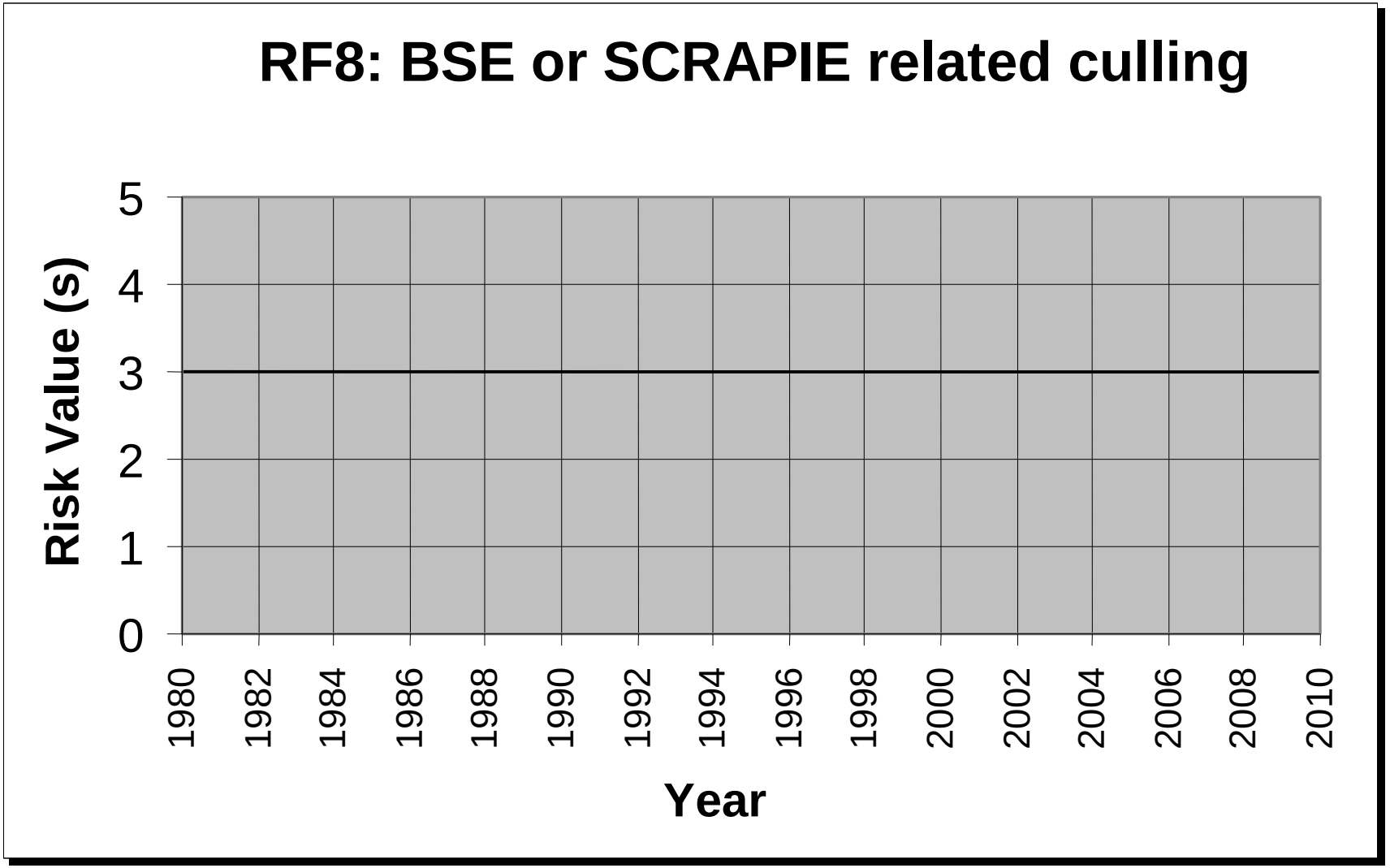
Note: plot the risk-values for the propagation risk and the processing risk separately



Note: plot the risk-values for the propagation risk and the processing risk separately

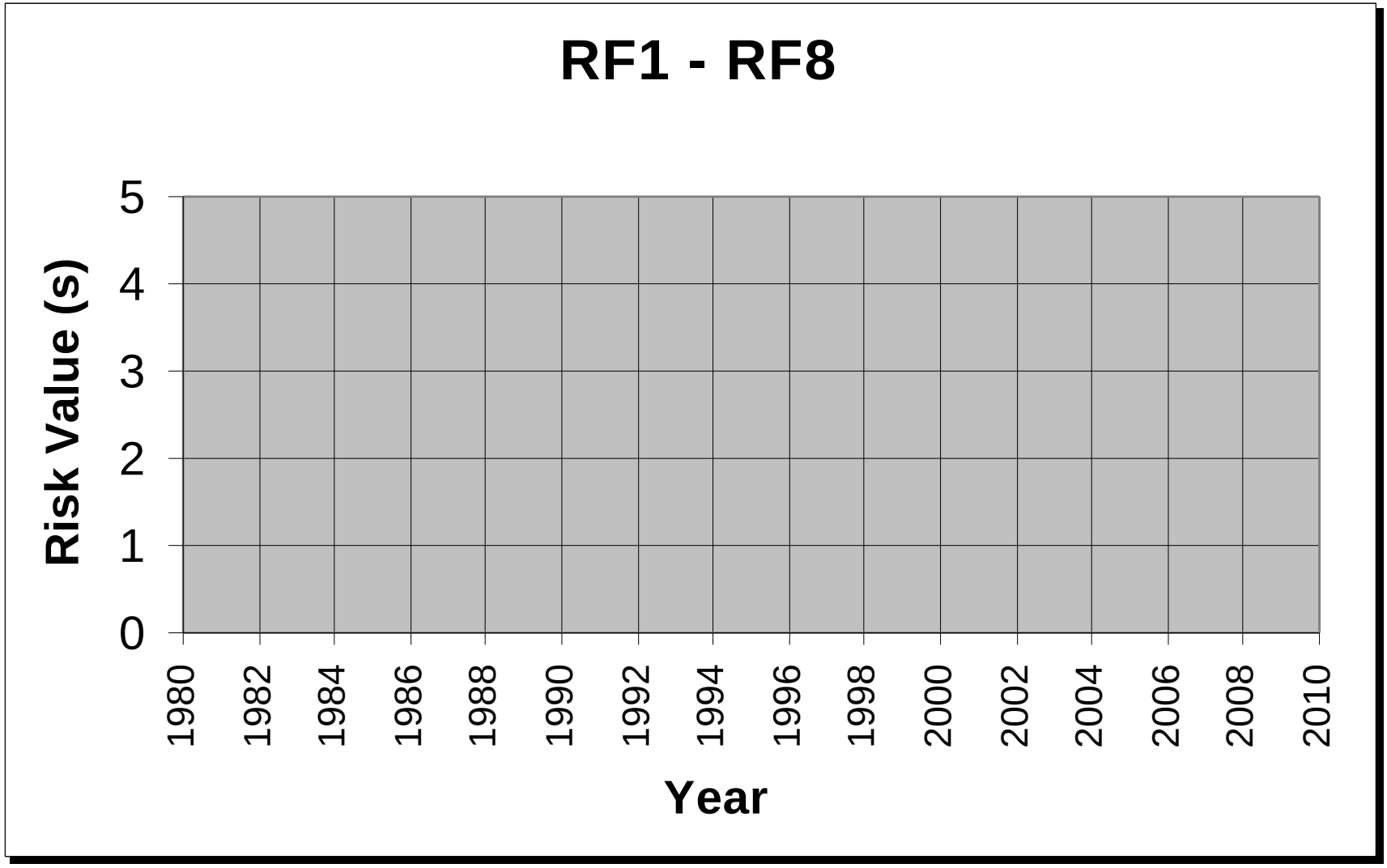


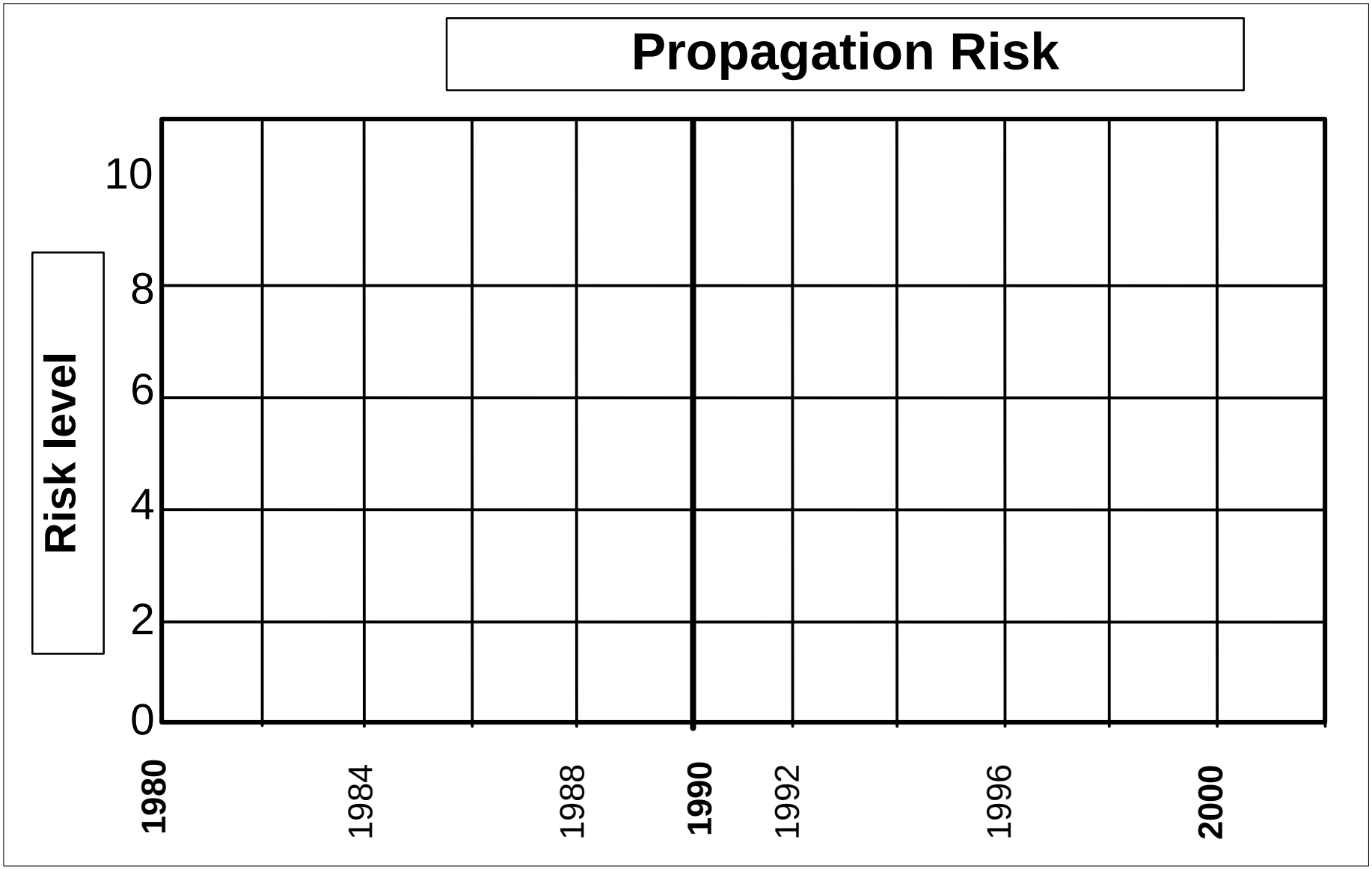
Note: plot the risk-values for the propagation risk and the processing risk separately

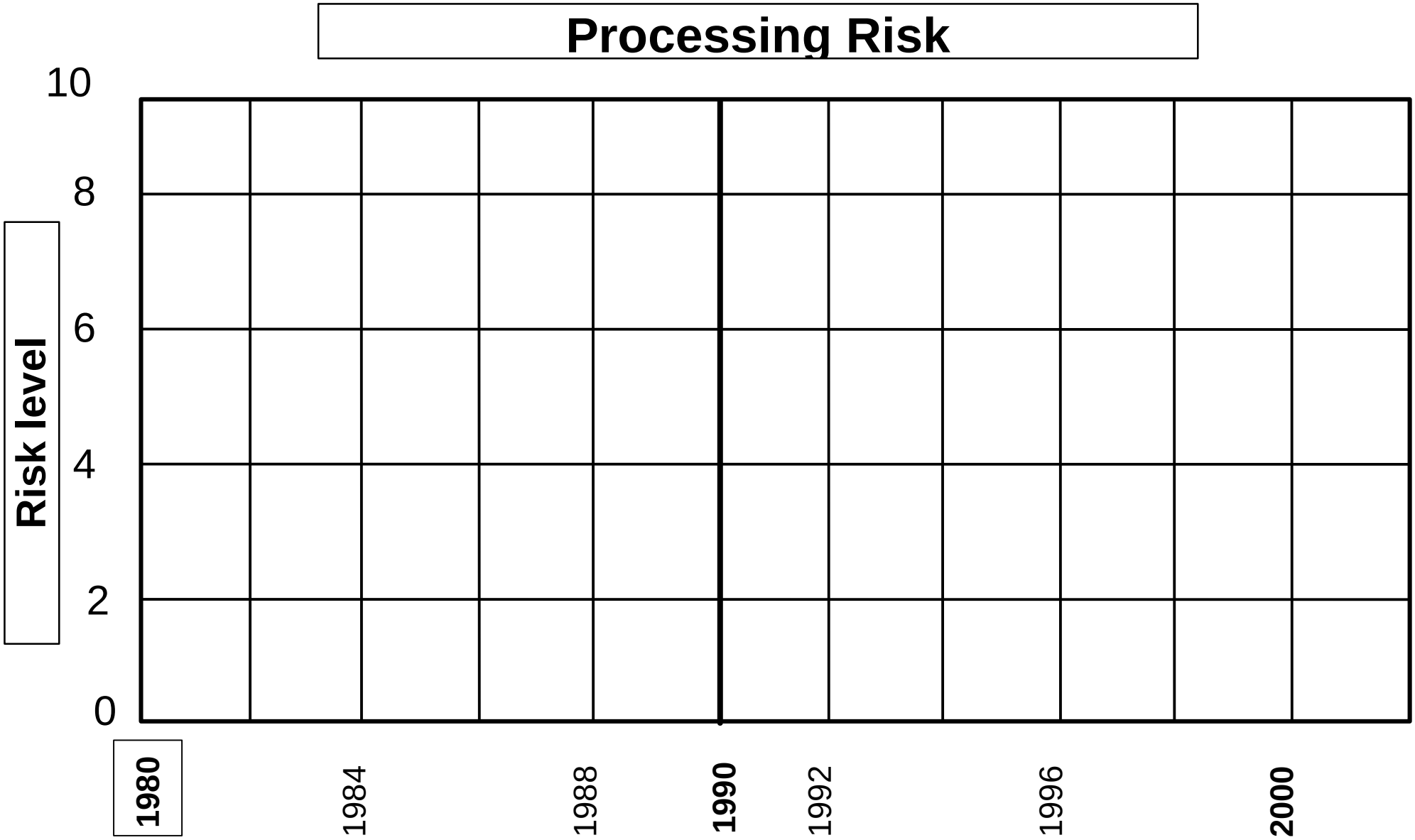


Summary of the dynamic of all eight Risk-Factors

Note: plot the risk-values for the propagation risk and the processing risk separately




Propagation Risk
Risk level
10
8
6
4
2
0
1980
1984
1988
1990
1992
1996
2000


Processing Risk
Risk level
10
8
6
4
2
0
1980
1984
1988
1990
1992
1996
2000